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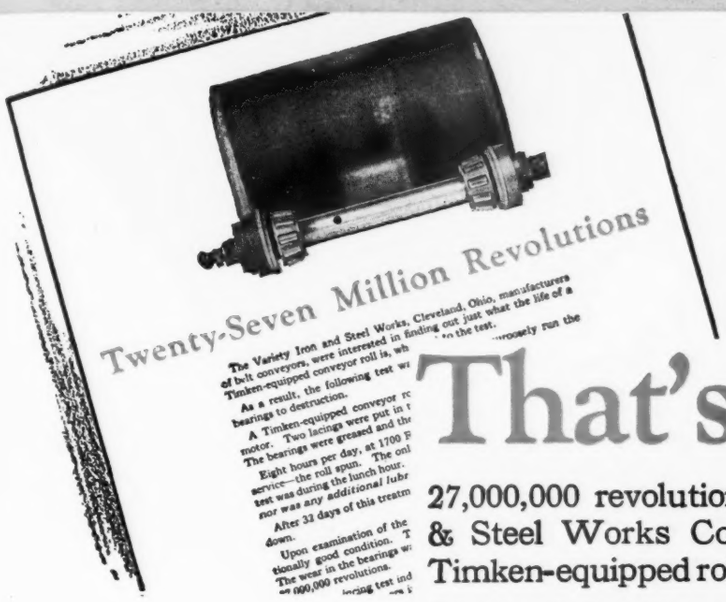
Chicago, August 22, 1925 (*Issued Every Other Week*) Volume XXVIII, No. 17


Twenty-Seven Million Revolutions
The Variety Iron and Steel Works, Cleveland, Ohio, manufacturers
of belt conveyors, were interested in finding out just what the life of a
Timken-equipped conveyor roll is, wh
As a result, the following test w
bearings to destruction.
A Timken-equipped conveyor r
motor. Two lacings were put in
The bearings were greased and th
Eight hours per day, at 1700 F
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The wear in the bearings w
000,000 revolutions.

That's Nothing

27,000,000 revolutions were run up by Variety Iron & Steel Works Company, of Cleveland, testing a Timken-equipped roller for their conveyor production.

But that's nothing, although the fact was then proudly advertised. Now the same roller on the same Timken bearings has completed 207,744,000 revolutions!

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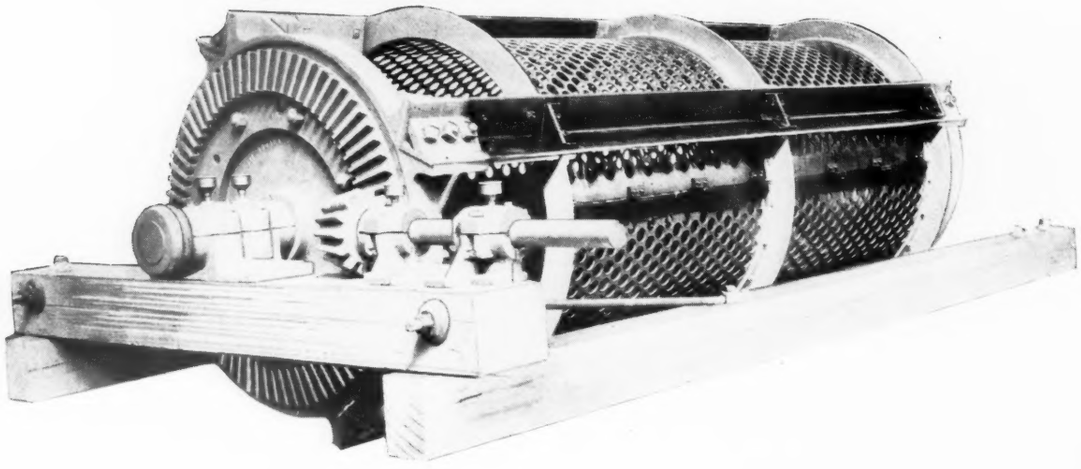

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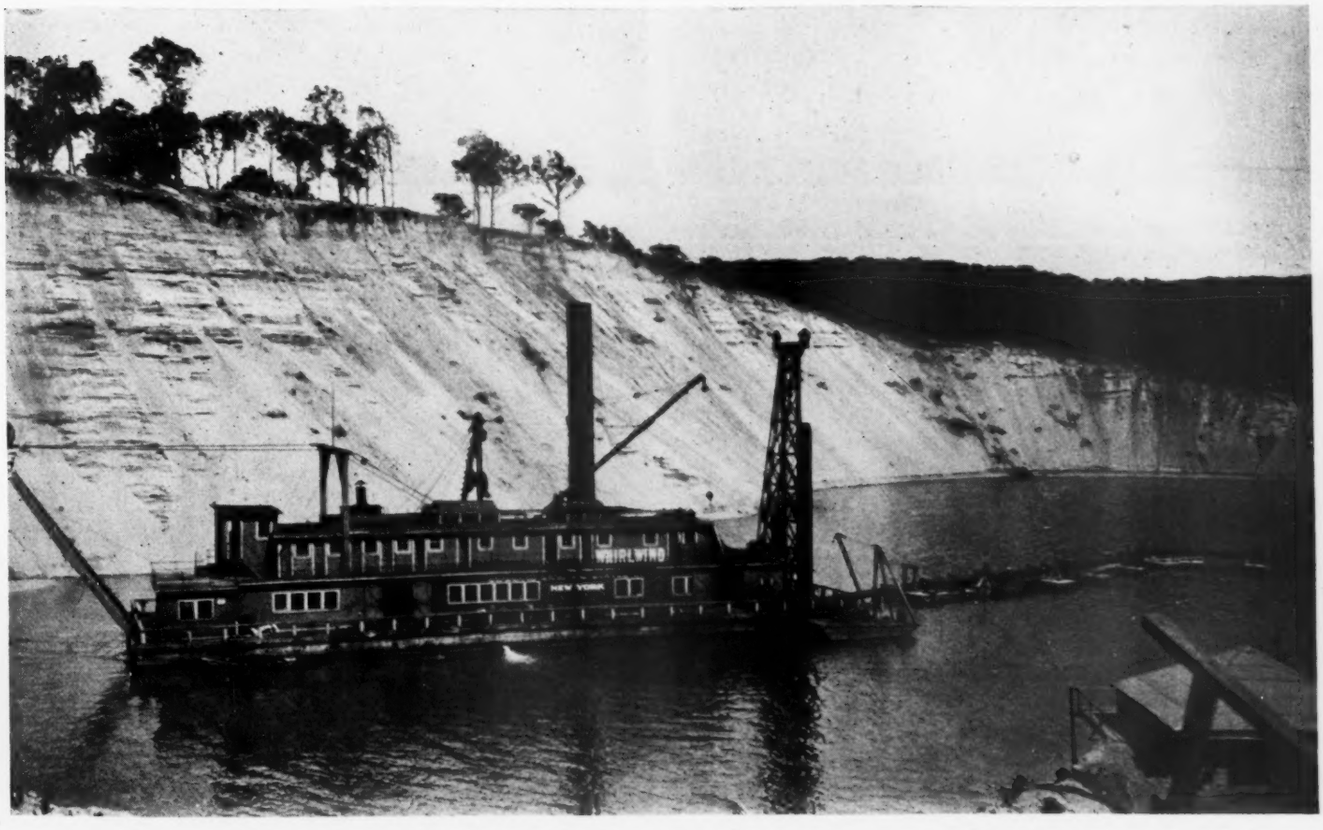
Vol. XXVIII | Chicago, August 22, 1925 | Number 17

A 600-Yard an Hour Dredging Plant Near New York

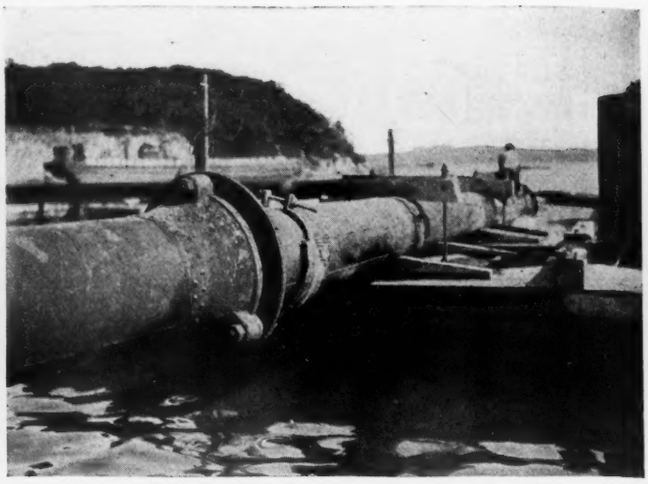
Seaboard Sand and Gravel Corporation Operates a 20-in. Suction Dredge at Port Jefferson, Long Island, and a Washing Plant with Some Unusual Features

AMONG the big plants which supply the tremendous tonnage of sand and gravel that New York and the cities and towns surrounding it consume daily, there are only a few dredging operations. With one exception, they produce relatively small tonnages, but this exception, the Seaboard Sand and Gravel Corp. at Port Jefferson, L. I., is among the really large tonnage plants of the country. Its regular production is 600 yd. per hour, and as the material weighs on an average of 2600 lb. per yard, this figures to 780 tons per hour. The plants which exceed this production anywhere are few in number.

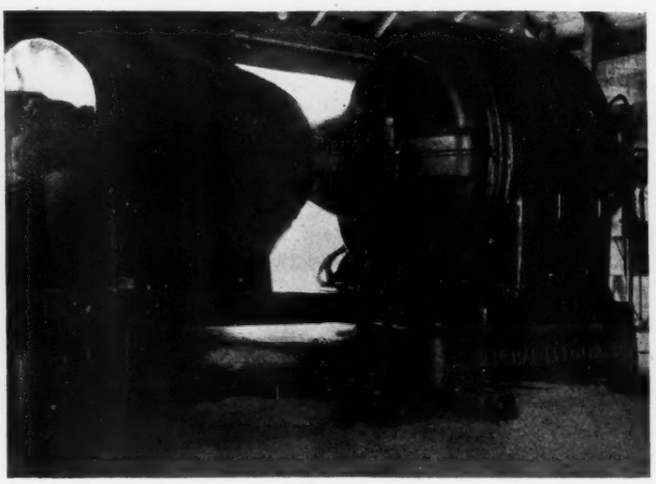
An unusual feature of this operation is that it was designed and carried out by men who have been engaged in the



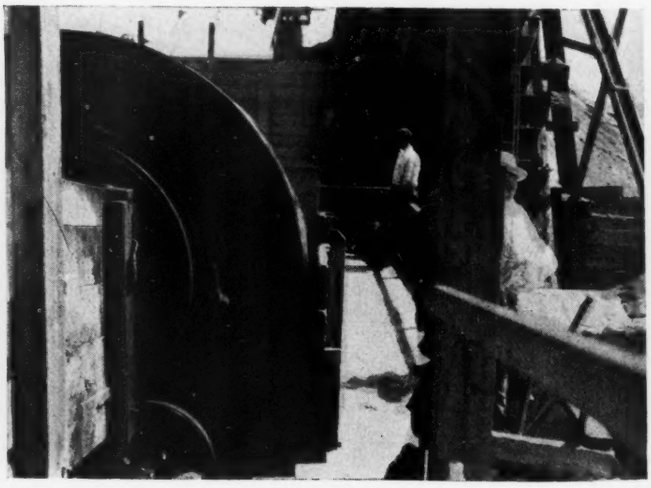
The bank is 125 ft. above the water and 25 ft. below. It is worked by a 20-in. pump dredge, the bank being first cut back by sluicing. Note the slope of the bank obtained by sluicing down the top



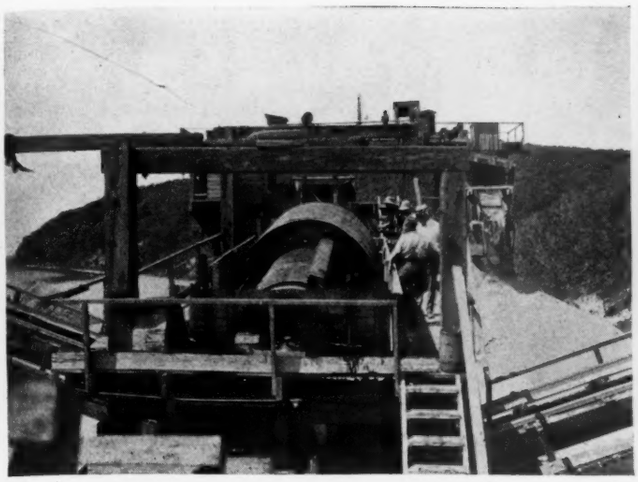
Left—The sluicing boat which has a direct-connected pump and motor which throws a stream at 100 lb. pressure. Right—Coupling in the pontoon line. This has a ball and socket joint which allows the dredge to swing. Only three bolts hold it together, which makes it easy to open when the line is to be extended

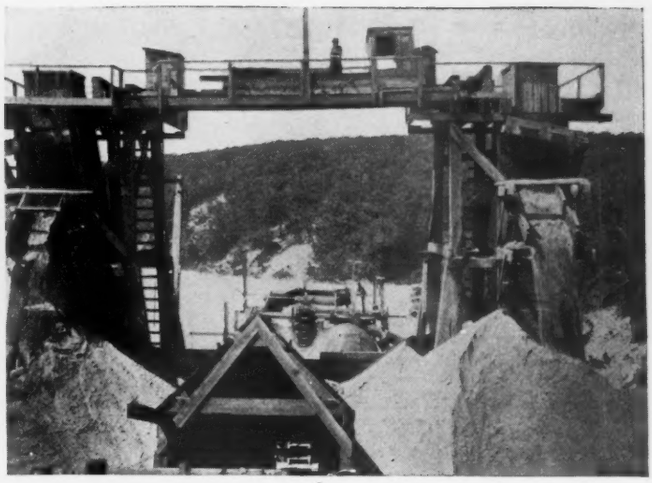


Left—The 20-in. booster pump on shore. It takes the discharge of the dredge directly into its suction and lifts it to the washing plant. Right—The 350-h.p. electric motor and silent chain which drives the booster pump at the same speed as that of the pump at the dredge

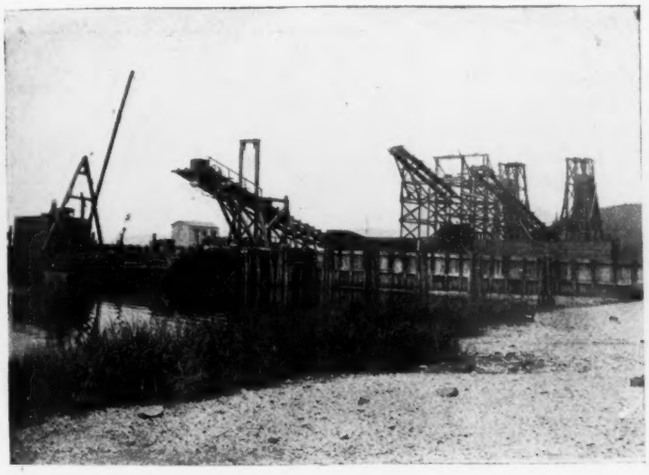


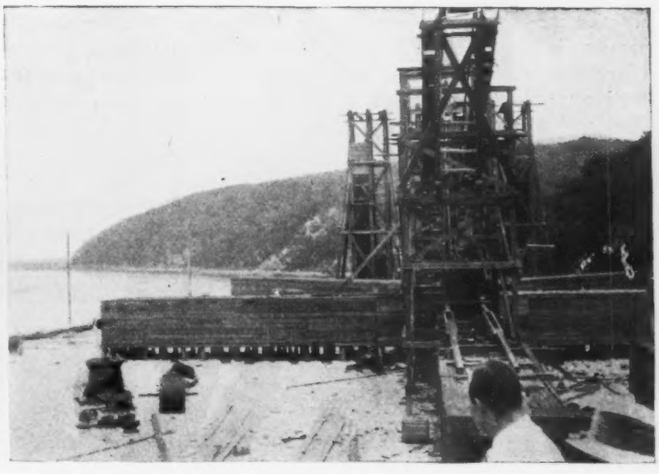
Left—The dredge discharge strikes into a V and is turned back on itself to break its force. Right—End of one of the two primary screens into which the discharge passes. These screens separate the sand from the gravel. The sand goes to storage and the gravel to a sizing screen



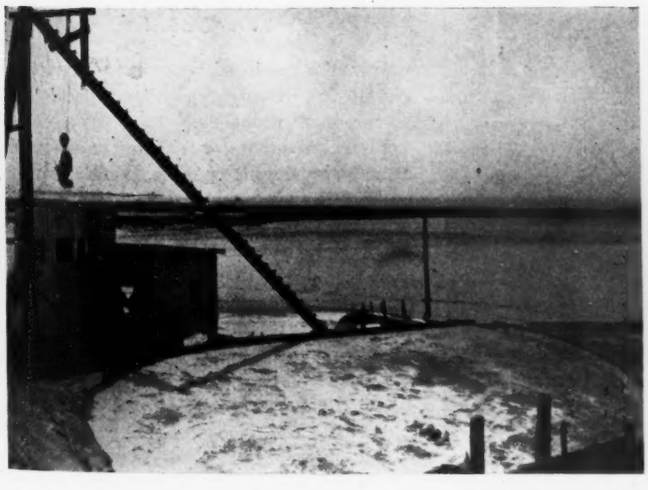


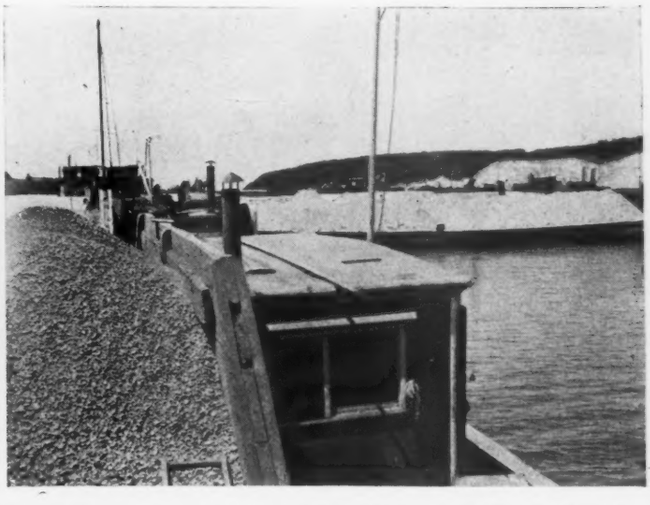
Left—The gravel sizing screen. This takes the gravel from the pair of primary screens and separates it into sizes each of which goes to a stockpile. Right—The sand elevators, each of which takes the sand from a primary screens and settling box and elevates it to a stockpile which is over a conveyor



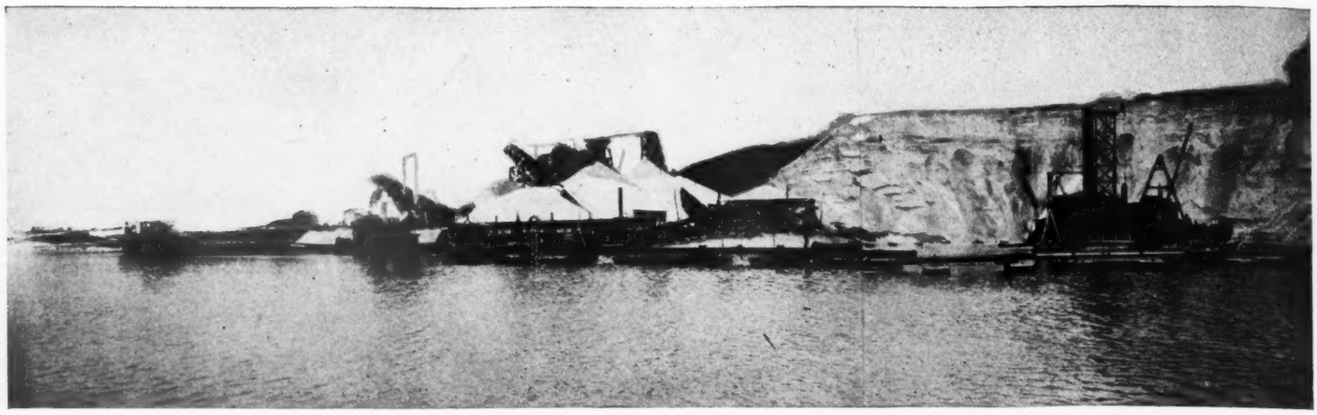


Left—View taken just after the plant was built showing the loading conveyor at the right, the gravel conveyors at the left and the sand elevators at the rear. Right—A construction progress picture which shows the tunnels under the stockpiles in which the conveyors run





Left—One of the two fine sand settling tanks and the derrick by which it is unloaded. Right—View at the "stake boat," which acts as a station for discharging loaded barges and receiving returned empties. The barges are trimmed by shovellers at the stake boat



Panorama showing the whole operation from dredging to barge loading

crushed stone business the greater part of their lives. Little things about the plant show this, such as the choice of screens and the way they are installed. But this does not say that these departures from ordinary sand and gravel practice were not justified, because their success is quite sufficient justification. There are few plants that can show so large an output for such a simple flow sheet and so compact a plant.

The deposit is one of those very large and deep deposits which are so much worked along the north shore of Long Island. It is quite evidently of fluvo-glacial origin since it is distinctly stratified and the lines of seasonal flow are plainly seen. It is probably an outwash plain or frontal apron, made by the waters that flowed out from the melting ice each spring of the glacial period for many years. At the place where it is now being worked the deposit is 125 ft. above the water and at least 25 ft. below. About 65% is sand and 35% gravel. The gravel contains a fair amount of cobbles (stones 6 to 8 in. in diameter) but almost no boulders. A few boulders are found at the very top, but these are taken care of in stripping.

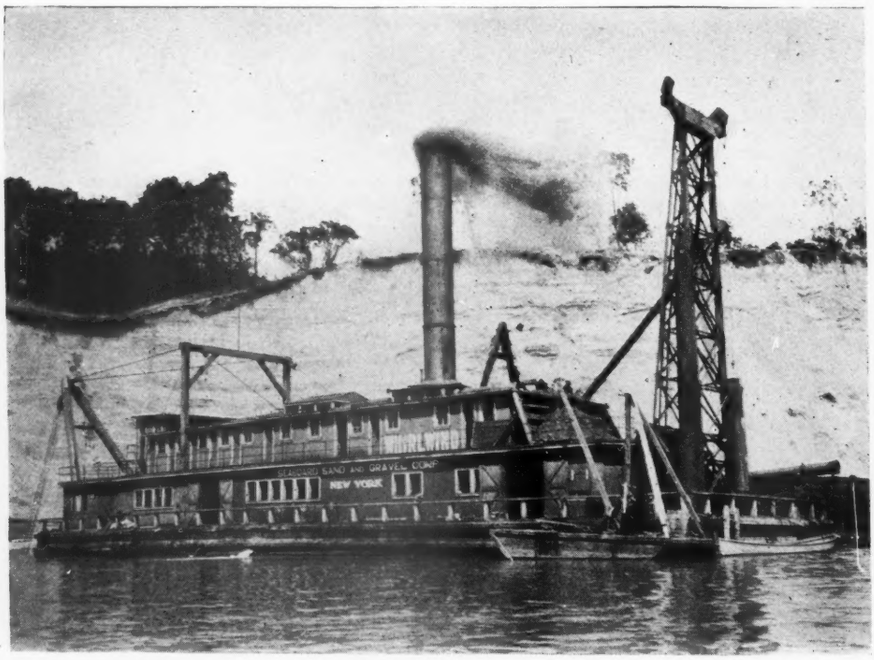
As the deposit is quite heavily wooded, it has to be stripped and the first step in stripping is to cut down the trees. The stumps are removed and the land plowed with a brush plow. The few boulders encountered are sledged to a size that will pass the pump easily and lift in place. What top soil there is, is so small a part of the whole deposit that the water washes it away quite completely when the material is sent through the plant.

Sluicing as well as dredging is used to work the bank. At first the bank was worked without sluicing, but heavy land slides buried the suction and caused miniature "tidal waves" that did considerable damage. So sluicing was adopted, but it is applied only to the upper part of the bank. In this way the bank is kept farther back from the water at the top and nearer the angle of repose, so that there are no longer any "caves" or "landslips" as the work proceeds.

The swinging chute by which barges are loaded

The equipment for sluicing consists of a Morris double-suction, single volute pump, throwing water through a 1⅜-in. nozzle at 100 lb. pressure. It is direct-connected to a 60 hp. General Electric motor and the whole is mounted on a small hull not much larger than one of the pontoons that supports the dredge pipe line. The nozzle is movable and mounted like a hydraulic "giant." One man handles it and it is a very compact and efficient device for the purpose for which it is intended.

The dredge is not a sand and gravel dredge of the ordinary type but a contractor's dredge, which was formerly operated by the James Stewart Co. along



The "Whirlwind," the 20-in. dredge, in action

the coast of Virginia and in the Hudson river. As are nearly all such dredges, it is steam driven, the power coming from four Babcox and Wilcox water tube boilers. The engine is a triple-expansion, cross-compound Morris and it is direct-connected to the 20-in. Morris centrifugal pump. This is a large pump of its kind, the runner being 68 in. in diameter. It runs at 210 r.p.m. For handling the suction and the swing lines there is a five-drum Mundy hoist, and a three-cylinder Mundy engine drives the rotary cutter on the suction.

This cutter is of Morris design and make, but is fitted with a Taylor-Wharton manganese steel head. Cutter shaft and suction pipe are supported by a "ladder" 60 ft. long which is of very heavy steel

James G. Shaw, vice-president and manager

plate construction. Its strength may be judged from the fact that the ladder, cutter and suction pipe together weigh 60 tons, or a ton to the foot. The arrangement is handled by cables that pass through a block at the apex of an A-frame on the bow of the dredge to the hoist.

The hull of the dredge is of wood and so are the pontoons and the hulls of most of the other boats used by the company. The dredge works in salt water and steel hulls require considerably more care than wooden hulls if they are to give the same length of service when exposed to salt water. For this reason the company believes that wood construction is better and wood has been used throughout the plant wherever it would serve.

The pontoon line from the dredge is made of ½-in. steel plate rolled to a 20-in. circle. It comes in random lengths and is welded at the plant along the seam and at the joints to make lengths which vary from 50 to 60 ft. Each length is carried on two wooden pontoons. The joints are Parker ball and socket joints, allowing motion in any direction. There are only three bolts that have to be unscrewed to open a joint, so lengthening or shortening the pipe is accomplished very quickly. By having everything ready and a new joint of pipe on its pontoons ready to be towed into place, a joint has been put in and coupled up with no more than 10 minutes lost time for the dredge. This constitutes something of a record, in the writer's opinion.

The dredge has sufficient power to pump directly to the washing plant, but it has been found more economical to pump first to a booster pump. This arrangement is more usually found in contractors' work than in regular sand and gravel operations. Wherever the writer has seen two pumpings in a sand and gravel operation, the second pump has always been a relay pump and not a booster. In relay pumping the dredge pumps to a sump from which the relay pump lifts it to the plant. In booster pumping the dredge pumps directly into the suction of the booster pump. The use of a booster takes less power, but many operators prefer to use a relay pump, as the system is more flexible. By having the sump large enough to provide some storage, the plant can be kept going with the relay pump while the dredge is shut down for a short time. But the use of a booster pump at this plant seems to be very satisfactory.

The booster pump is also of Morris make and it has a runner 54 in. in diameter. It is driven by a 350 hp. General Electric motor through a Morse silent chain drive. The thrust bearing is of the marine type and water connections are made to this bearing for cooling and to the packing glands to protect the packing from grit. Water for this purpose is supplied by a 3-in. pump. These features of water-cooled bearings and water protection for the packing are also found on the dredge pump.

The booster lifts the discharge to the washing plant and here there is an arrangement that is worth a special note. One of the minor problems of dredging is to reduce the velocity of the pump discharge so that it will flow slowly into the screens. At this plant this is done by shooting the discharge into the apex of a V of timbers, so that the discharge has to turn around and run in a reverse direction. It is spread on this V and divided into two streams each of which flows into a screen.

These two screens, of Link-Belt make, each of which is 20 ft. long with a main section 5 ft. in diameter, are like those used in a crushed stone plant. The inner section has 2¼-in. round openings. Outside of this is a coarse mesh jacket of woven wire of manganese steel, the only function of which is to keep the heavy pieces from striking the outside sand jacket (another feature borrowed from crushed stone practice). The sand jacket, which is 84 in. in diameter, is of "Ton-Cap" wire-cloth with ⅛-in. openings.

The oversize of the 2¼-in. section goes to a No. 6 Allis-Chalmers crusher. There are two of these, one being held in reserve for such times as the other needs repairs. The undersize of the sand jacket goes to sand settling boxes. The intermediate product, which is gravel in all sizes between 2¼- in. and ¼-in., goes to the gravel sizing screen. The oversize after passing the crusher is returned to the pump discharge by an elevator so that it is sent again to the screens.

The gravel sizing screen is of the same length as the others and its main section (60 in. in diameter) has 1¼- in. perforations. Outside of this is a jacket with ⅜ square perforations. Hence the products are: gravel between 2¼ and 1¼ in., gravel between 1¼ and ⅜ in. and "grits" between ⅜ and ¼-in. Conveyors from this screen take the different sizes to stockpiles.

Martin, Lynch, the plant superintendent

The sand settling boxes are hoppers 12x16 ft. at the top and there is one for each side of the plant. Each discharges through an adjustable gate to an elevator 36-in. wide, which has two lines of 18-in. buckets staggered. These raise the sand high enough to allow it to run out on a stockpile.

These settlers serve as classifiers as well as settlers, for the overflow carries away a great deal of fine sand. The sand from the settlers which goes to the elevators mentioned is concrete sand and the sand in the overflow (all minus ⅛-in.) is plasterer's sand or mason's sand. This is settled in two large concrete tanks of a peculiar shape, something like an ellipse. The current enters and flows along one side and then along the other,

where there is a peripheral overflow. There are two of these tanks set on either side of a Lambert derrick and hoist which has a 1⅝-yd. bucket by which the sand is excavated. Each tank holds 1250 yd., more than would be caught in an ordinary day's run, so there is ample time to empty one tank while the other is filling.

All the water used for washing is salt water from the bay. A 5-in. Morris pump of the pressure type supplies water that is used on the screens for sprays.

All sizes of gravel and the two sizes of sand go to stockpiles, one for each size. These stockpiles are built over tunnels in which conveyor belts run. There is a main conveyor belt 42 in. wide which takes the material to the docks to be loaded. Four tunnels, in each of which is a 36-in. belt communicate with the main tunnel from points beneath the stockpiles at which there are gates so that any stockpile may be drawn from on to the conveyor. These gates are of the Link-Belt segmental type.

A number of different makes of belt are used and different patterns of idlers and troughing pulleys. Experiments are being carried on with some new designs to find out which is most satisfactory for the conditions at this plant.

As a 600-yd. barge has to be loaded every hour, which must include the time for placing the barge and towing it out of the loading position, the conveyor belts must have a high capacity. They are run at 450 ft. per minute, and are well loaded. The main belt discharges to a swinging chute by which different parts of the barge may be loaded. Barges after being placed in position by a towboat are moved under the chute by a Lambert hoist which is used as a barge puller. A barge is loaded at one end and then pulled through to load the other end, the center being loaded last. This is done to keep the barge from being overloaded at one end. The barges are all of the flush deck type and the load is carefully trimmed by hand at the "stake boat."

The "stake boat" is a sort of station for receiving and delivering barges. It is an old car ferry boat anchored in the bay about 500 yd. from the dock. Here the tugs from New York and other places leave the empty barges and pick up the filled barges. The company's tug *Garrison* picks up the empties and tows them in turn to the loading dock and brings the filled barges to the stake boat.

The sand and gravel from this plant is shipped to great distances and for many purposes. Many shipments of sand go up the Hudson and through the New York state barge canal as far as Buffalo. This is because the sand is used for other purposes than making concrete. One foundry in Bridgeport, Conn., uses 4000 tons a year of this sand to place in its "rattlers" to polish castings. "Grits" are in great demand and are shipped long distances for making pipe, block and other forms of concrete products. One shipment of ¾-in. gravel, which was being loaded while the writer was at the plant, was going to be spread on oyster beds to protect oyster spawn in the earlier stages of its existence. But of course the greater part of the product is sold for the usual purposes of making concrete and to use in mortars and plasters.

Although the deposit is quite evidently glacial in its origin, there is a great uniformity in the kind of rock from which the pebbles are made. Over 90% of the pebbles are of hard, white quartz. The other 10% are of all kinds of hard rocks, granite perhaps predominating. The sand is highly siliceous and is unusually "sharp." As graded in the plant for concrete sand, it has a modulus of fineness of a little over 3.00 and fills such specifications as those of the various highway boards and the New York transportation board, which has an inspector at the plant.

The design of the plant was due to James G. Shaw, vice-president of the company, but Mr. Shaw is anxious to give credit to Martin Lynch, the plant superintendent, whose attention to details and to refinements has made the present large capacity possible.

All the motors in the plant except those previously mentioned are of Allis-Chalmers make.

The office of the company is at 26 Cortlandt street, New York. W. B. Duncan is president, James G. Shaw vice-president and manager and Anderson Dana is secretary.

Expanding Field of Highway Research

SPEAKING before the North Carolina section of the American Society of Civil Engineers in Asheville, N. C., A. N. Johnson, chairman of the Highway Research Board, summarized the status of highway research in the United States. The following is a digest of the talk.

Research differs from engineering practice in that the research worker has no precedent from previous experience to guide him. He may be wholly unaware of the significance of his results, for these are often of vital concern and mankind will benefit by his discovery.

The tremendous increase in road building has caused the highway engineer to focus his attention on research to help him solve the problem of constructing and maintaining roads to take care of the demands of traffic. The Highway Research Board has compiled a list of highway research projects totaling 479 and divided as follows:

State highway investigations	205
University investigations	184
Municipal, county and industrial	90

These figures show the interest of highway builders in research as a means for aiding in the highway problem.

The results of such investigations as the Bates, Pittsburgh and Arlington experimental roads have been of great value to road builders. The Bates road, costing the state of Illinois about $250,000, has given information that resulted in a modified cross section for concrete roads that while strengthening the road slab to carry traffic, also resulted in a saving in the cost of construction due to lessening the amount of concrete used.

Research conducted by the U. S. Bureau of Public Roads and other agencies has resulted in the more economical design of roads and has pointed the way to better methods of construction.

In closing his talk, Dean Johnson pointed out the value of the work of the Highway Research Board. This organization, with its contact men in the various engineering schools and state highway commissions, functions as a clearing house for highway research data. In addition to this function, the board is conducting several investigations, financed by industrial concerns, on such problems as the value of reinforcement in concrete roads, the development of earth roads and on culvert pipe. The opportunity presented by this character of cooperation furnishes unique auspices under which such work may be carried on that is scientific in its nature and impartial in its findings.

Concrete Should Be Proportioned by Weight

SAND measured and sold by weight is rapidly becoming popular. The proportioning of aggregates by weight is a practice that is just as economical and practical. Both measuring and proportioning by weight is a practical method of furnishing a uniform amount of dry sand under most conditions. Because of this fact many dealers are switching to a system of marketing aggregates by the ton and equipment manufacturers are now placing batch measuring hoppers on the market that will proportion aggregates by weight. Both are moves in the right direction.—*The American Contractor.*

A Correction

IN the report of the Cedar Point (Ohio) meeting of the executive committee of the National Sand and Gravel Association with Ohio, Indiana and Michigan producers, it was stated that F. D. Coppock was chairman of the National Association's gravel ballast committee. The chairman of this committee is Earl Zimmerman, vice-president and general manager of the Ohio Gravel Ballast Co., Cincinnati, Ohio, who read the committee report at the Cedar Point meeting.

Pittsburgh White Sand Company

One of the Largest Producers of Silica Sand Which Has Recently Improved Its Plants in the Mapleton, Penn., District

THE Pittsburgh White Sand Co. is one of the large producers of silica sand in the district near Mapleton, Penn., in which there are a half dozen plants or more. The deposit worked by this company at Mapleton is exceptionally high grade. It is of a pale yellow color in the quarry, but it washes as white as snow and contains 99.70 to 99.88 SiO_2 as it is shipped. A peculiar product of this plant is "golf sand," made by settling the overflow of the sand washers. This is a clean, fine sand, much liked by golfers for making tees and scouring clubs and balls, and it is shipped to a number of Pennsylvania golf courses.

The quarry face is from 75 to 80 ft. high and the strata "stand on end" as is the case with all the formations in this part of the country. The rock is a sandstone, not so hard as the quartzites worked in the same neighborhood for making silica brick, but harder than many sandstones quarried for silica sand, as it has to be crushed before being sent to the chaser mill and sand washers. It is drilled by Ingersoll tripod drills, "snake holes" being put in wherever possible. A Sullivan jackhammer is used for block holing and a Sullivan angle type compressor and an Ingersoll-Rand two-stage compressor furnish the compressed air. Atlas 40% and 35% powder is used, and 30% gelatine for block holing.

The rock is loaded into cars by hand and drawn to the plant by mules. The plants are separated from the quarry by a high ridge through which two tunnels have been driven on the quarry level and the mules pull the load through these tunnels, which are about 150 ft. long.

At the end of No. 1 tunnel the cars are hooked on to an electric hoist and drawn up an incline to the top of the plant where they are dumped over a grizzly to the receiving bin. The oversize of the grizzly goes to Lewistown jaw crushers which discharges into the same bin.

From the bin the rock flows through a gate to Lewistown chaser mills which are a modification of the Chillean mill or "wet pan." There is a "pan" 9 ft. in diameter in which is a circular track on which two edge-runner rolls (each 5 ft. in diameter) rotate. The horizontal shaft that carries these rolls is driven by a miter gear and pinion above. The discharge is through ⅞-in. perforations in a circular plate surrounding the track and this discharge goes to two revolving screens of the Lewistown type, one on either side of the mill.

These revolving screens are 6 ft. in diameter but only 30 in. long. One end is closed, the other partly closed by a ring around the edge to retain the material in the screen. Inside the screen are lifters, 6 in. wide, which raise the oversize as the screen revolves and dump it into a chute that leads back into the mill. Thus all the material is kept in circulation until it is fine enough to pass the screen. No. 10 mesh brass wire screen cloth is used on these screens.

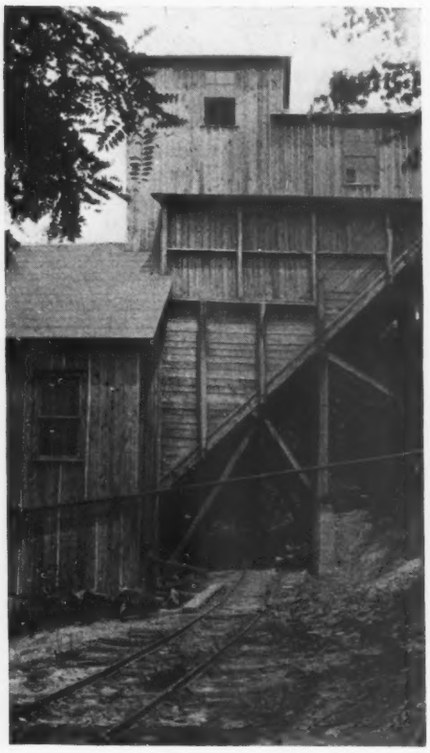
There are two units to the plant, each consisting of a "chaser" mill and two screens and each unit can handle 450 to 500 tons per day of 10 hr.

No. 1 (left) and No. 2 (right) plants of the Pittsburgh White Sand Co. Both have been rebuilt and new equipment added in 1924 and 1925

From the screens the sand and water go to two sets of 22-in. Lewistown sand washers, eight in each set. These are further divided into two sets of four, the first set being washers, the second rinsers or rewashers. These sand washers are the inclined screw in a trough which are used almost universally for washing silica sand. Silica sand carries almost all of the impurities that accompany it in a film on the outside of the grain or "berry," this impurity being in part the "binder" by which the grains adhere to one another to make

sandstone. It requires a scouring or scrubbing action to remove this film and the screws of the Lewistown washer are admirably adapted to give the scrubbing action required.

All the washed sand, which is dewatered



Receiving hopper and primary crushing house at No. 1 plant

to practically surface moisture, goes to a conveyor belt that carries it to the drainage house. Here it is drained and recovered by another conveyor running in a tunnel under the floor which takes it to the dryer.

The dryer is the Lewistown steam dryer used so much in this locality for drying silica sand. There are really two dryers in this set, but the two are enclosed in the same brickwork. The feature of the Lewistown dryer is the independent regulation of the heat of each set of pipes over which the sand must pass in falling through the dryer. A body of sand is maintained in the dryer surrounding the pipes but the heat is so adjusted that the bottom part is not overheated, the greatest heat being used where there is the most water to evaporate. The pipes are in a closed circuit with the boiler, the water of condensation being returned to the boiler by an automatic pump.

The dried sand flows through openings in the bottom of the dryer into hoppers and through gates in these to a conveyor belt. A compressed air pipe at the hopper permits the holes to be cleaned in case of

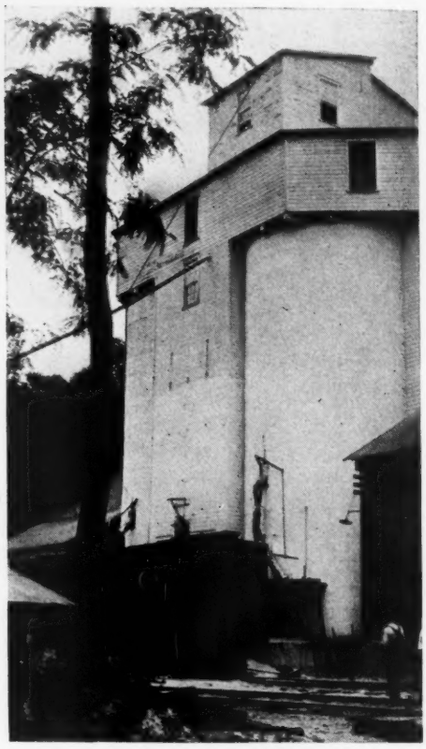
Settling tanks in which fine (golf) sand is collected

any stoppages. The conveyor is of the flat belt type supported on 10-in. hollow cast iron rollers.

From the dryer the sand is elevated to two Hum-mer screens which are above the storage bins. These are covered with either 16 or 18 mesh brass wire cloth and divide the sand into two sizes. Each size falls into one of the two storage bins.

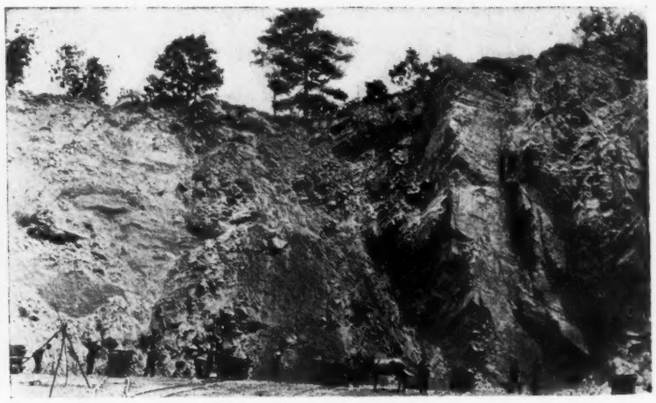
These bins, which are among the recent improvements which have been made at this plant, are of concrete, circular in form, like a concrete silo. Each will hold 600 tons. Gates are let into the side at the right height for car loading and these gates empty into an articulated steel spout which can be moved around to distribute the sand in a car. As this is dry sand, it is always shipped in tight box cars.

The overflow of the sand washers carries considerable fine sand and a little clay. This overflow runs to these settling boxes each of which is about 35 ft. long and 15

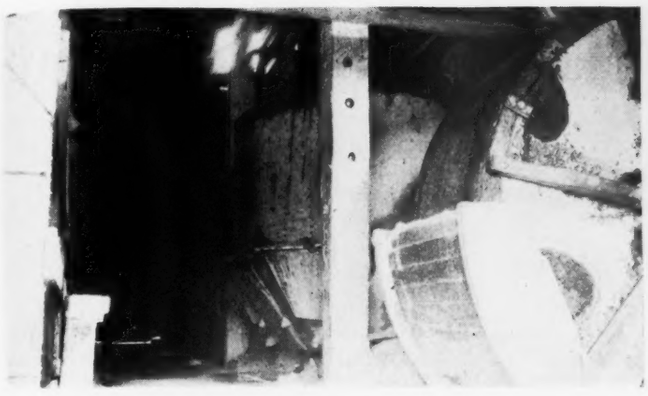


The concrete silos with the dry screening plant above

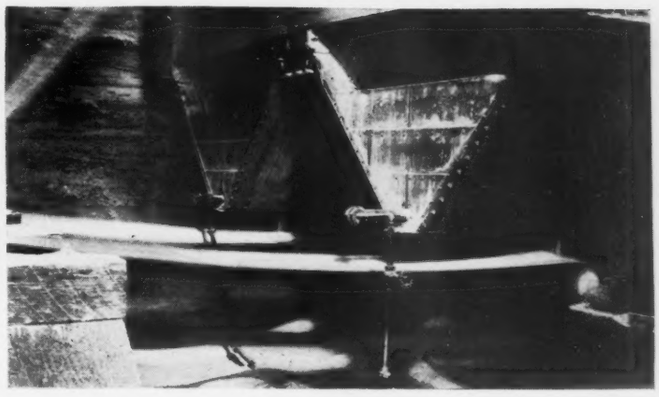
Entrance to the 150 ft. tunnel which connects the plant and the quarry. Mules draw the cars through



The quarry face which is about 80 ft. high. The rock is a moderately hard sandstone and almost pure silica



One of the "chaser" mills and revolving screen



Sand running from the steam dryers on to conveyor belts

ft. wide, arranged in series. The fine sand settles out as the current passes through these boxes and overflows at the end, carrying the clay with it.

This fine sand is what is sold for golf sand. It is shovelled out of the boxes and then loaded from the pile into cars or trucks by a Barber-Green wagon loader.

The above description is of the No. 1 plant of the Pittsburg White Sand Co., which had just been rebuilt and added to when the plant was visited in 1924.

W. M. Snook, who had recently taken charge of the plant, worked for seven years as engineer for the Lewistown Foundry and Machine Co. on the design and erection of silica sand plant machinery and before that time he had some 13 years' experience with silica sand plants. So naturally he "knows the game." The No. 2 plant, which stands a short distance away from the No. 1 plant, was at that time being overhauled and repaired.

Most of the product of this plant goes to the making of fine glass for which it is adapted by its purity and the grain size which is important in the melting of the glass mixture.

The offices of the Pittsburg White Sand Co. are in the Farmers Bank building, Pittsburgh, Penn.

New Developments in Colored Cement Stuccos

COLORED portland cement stuccos for all purposes, factory-prepared, non-fading and with a degree of uniformity is the latest development in the field of ornamental treatments for buildings.

Architects and builders who have used colored stucco in the past have heretofore been under the necessity of trusting to the care of the mortar mixer at the job for results. Failure on the part of the contractor to buy the proper pigments or carelessness on the part of the mortar mixer would result in a faded stucco or one which dried out to several different shades.

Continual experiment and research work being conducted by the cement industry have shown that only the highest grade of mineral pigments should be mixed with cement if fading is to be avoided. In addition the experience of manufacturers of colored concrete products has been that the best results are obtained by mixing the cement and color together for a longer time, and more thoroughly, than is possible on the job.

As a result several firms are now engaged in marketing a prepared stucco, the base of which is standard portland cement which has been shown to have the greatest weather resistance of any stucco material, and which has back of it the combined research work of such institutions as the U. S. Bureau of standards and American Concrete Institute.

To a carefully determined amount of cement is added an exactly fixed amount of mineral coloring material. Some shades of stucco require the use of as many as four different pigments.

The Sand-Carrying Capacity of Quicklime

THE United State Bureau of Standards has recently completed an investigation of the sand-carrying capacity of quicklimes, together with a study of the relationship of the putty yields of quicklime to their sand-carrying capacities.

The investigation covered a representative group of 14 quicklimes, and consisted of determinations of putty yield, together with tests for tensile and compressive strength, plasticity, and shrinkage of mortars prepared from these limes. In the preparation of the mortars a weighed amount of quicklime was carefully hydrated (slaked), allowed to soak for from 16 to 24 hours, a weighed amount of sand then added, and the test specimens prepared. The mortars were proportioned by weight, and varied in composition from 50% lime and 50% sand to 10% lime and 90% sand, at 5% increments.

A study of the results indicate that there is little relationship between the putty yields of the quicklimes and their sand-carrying capacities. The sand-carrying capacity of high calcium limes, however, does appear to be, to a slight extent, proportional to the amount of putty yielded per unit weight. When the comparison is confined to those mortars richer in quicklime than 20% by weight of the dry mix, magnesian quicklimes, although they give small putty yields, produced mortars stronger than those made from high calcium quicklimes. When a comparison is made of the mortars of the leaner mixes, 20 to 15% quicklime, it is found that the high calcium quicklime mortars equal and often exceed the strength of those prepared from magnesian quicklimes. If we disregard the calcium quicklimes, giving exceptionally low putty yields, it is believed that the sand-carrying capacity of a quicklime is independent of its putty yield.

A further study of the results indicates that a mortar should be neither richer in quicklime than 20% nor leaner than 10% by weight of the dry mix, with the best results to be obtained from a mortar of the composition approximating 15% quicklime and 85% sand. Converting from a weight to a volume basis we have for the 20, 15, and 10% mixes a 1:1, a 1:1½, and a 1:3 mix, respectively. This calculation is based on the assumption that it takes 27 lb. of quicklime to make a cubic foot of putty, and that the weight of dry Potomac River sand is 100 lb. per cu. ft. When the bulking of moist sand is considered, and the weight of Potomac River field sand taken as 78 lb. per cu. ft. we have for the above 20, 15, and 10% mixes a 1:2, a 1:3, and a 1:4 mix, respectively. The results also indicate that to be satisfactory, the volume shrinkage of a mortar should be less than 15% at an age of 30 days, and that a mortar can be considered as oversanded when it fails to give a value of 1.0 for ten times the sine of the angle of the bob on the Emley plasticimeter, and a tensile strength of 10 lb. per sq. in. at an age of seven days' storage in air.

Develop Alabama Rock Asphalt

JOHN R. SCOTT and associates of St. Louis, Mo., have acquired 2000 acres of asphalt rock deposits in Colbert county, Ala., for the production of rock asphalt. The new company will have a capital of $1,000,000 and proposes the erection of a modern plant with a connection on the Southern R. R. Previous to this the Colbert Lime-Rock Co. (reported in a recent issue of Rock Products), purchased land at Barton, Ala., and is now reported in operation.

R. C. Fletcher's Iowa Crushed Stone Plant

Iowa Limestone Co. Operates Successful Plant at Alden. Going in for the Manufacture of Specialty Products

By Charles A. Breskin

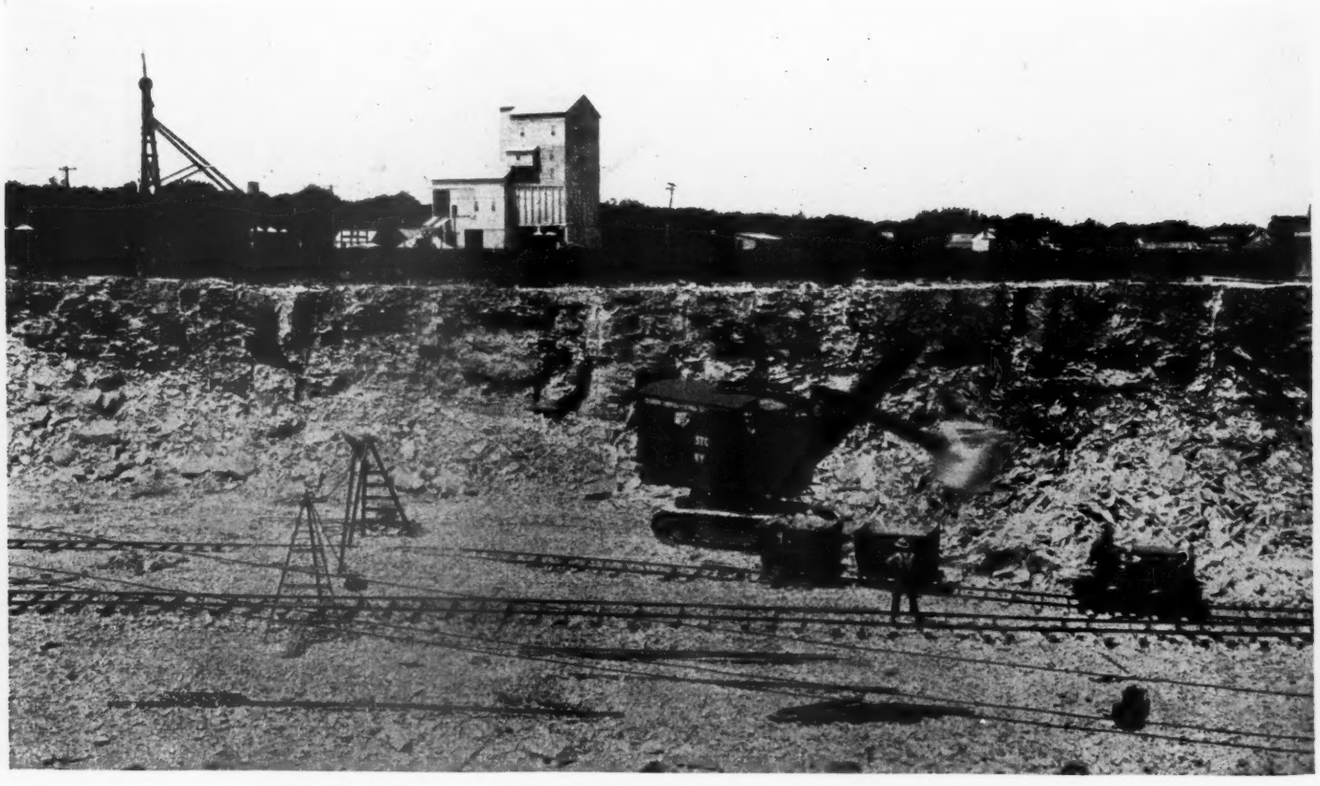
IN 1914 the Hale-Roberts Stone Co. was organized and built a plant at Alden, Iowa. This plant operated under the same management until June, 1924, when it was taken over by R. C. Fletcher, of the Flint Crushed Gravel Co., of Des Moines, Iowa. The name of the company was changed to the Iowa Limestone Co., and the plant partially rebuilt, so as to make possible additional crushing and screening capacity. Under the new management the quarry operation underwent a radical change and instead of relying solely upon business of crushed stone for roads, pavements, etc., the new management went in for agricultural limestone and built up a splendid business for this product. At the time of the writer's visit (July, 1925) plans were being made for the erection of a grinding plant in which such products as asphalt filler, chicken grit, etc., will be made.

The limestone deposit, some 35 acres in extent, is composed chiefly of high calcium stone, running better than 95% $CaCO_3$. Holes have been drilled to a depth of 137 ft., and the same quality of stone was found all the way. Tests made by the Iowa State Highway Commission of the stone made into 6x12 in., concrete cylinders, 1:2:4 mix, showed an average crushing strength of 2,876 lb. per sq. in.

R. C. Fletcher

The deposit has an average overburden approximately 30 inches deep. This is removed by a Pawling and Harnischfeger gas shovel fitted with traction wheels. The shovel works only part of the time as it removes the overburden much faster than the face of the quarry is advanced.

Holes for blasting are put down by an Armstrong well drill, which drills 5½ in. holes to a depth of 26 ft. The holes are spaced 10 ft. apart and 11 ft. from the face and are loaded with 40% gelatine dynamite. From 2 to 20 holes are shot at one time. Whether 2 or 20 are shot, the results are pratically the same, 3 to 4

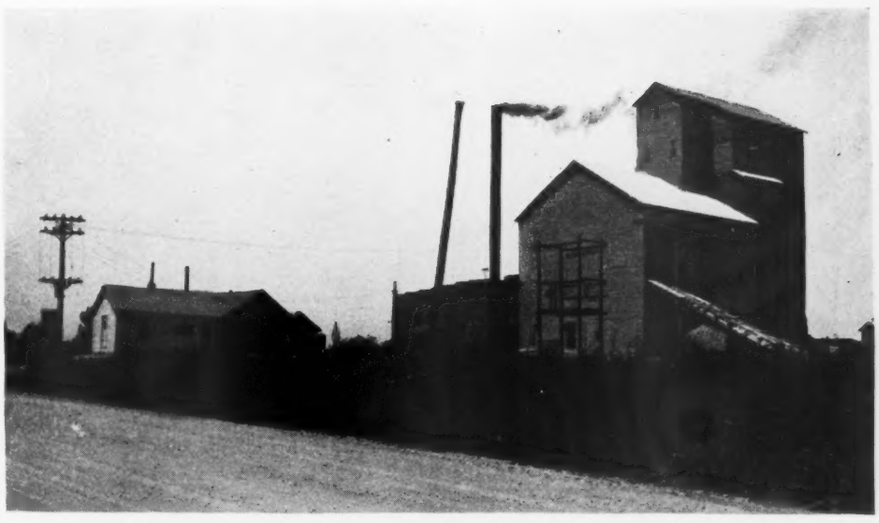


View of quarry of Iowa Limestone Co., showing complete operation

tons of stone to 1 lb. of dynamite, due to the rifted and shattered condition of the bed, as the individual layers rarely exceed 4 to 5 in. in thickness. The object is merely to loosen the rock with dynamite and no secondary shooting is necessary.

The quarry face at the present time runs about 24 ft. high and 450 ft. in length. It is being worked in a semi-circular shape as it gets closer to the plant. The ultimate aim is to have an 800-ft. working face.

Loading stone into cars for transportation to the crushing plant is done by a model 32 Marion electric shovel fitted with a 1¼ yd. dipper. Power for its operation is obtained from a transformer station located on the quarry floor. The cars are of 2 yd. capacity, all steel, end dump, fitted with Ottumwa roller bearing trucks. These are hauled to the foot of the incline of the crushing plant by two Whitcomb Fordson locomotives. The distance from the incline to the present working face is 900 ft., and one of these locomotives hauling anywhere from 1 to 8 cars makes a round trip in five minutes. The haulage system consists of one main 36-in. gage track, and two at the incline, one for loaded cars and one for empties.



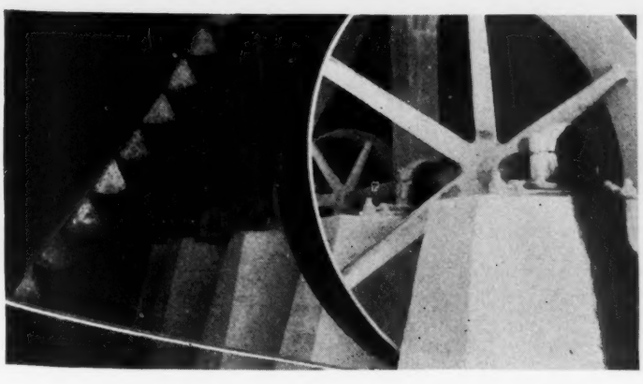
Plant of the Iowa Limestone Co., Alden, Iowa. Office, machine shop and oil storage in the background

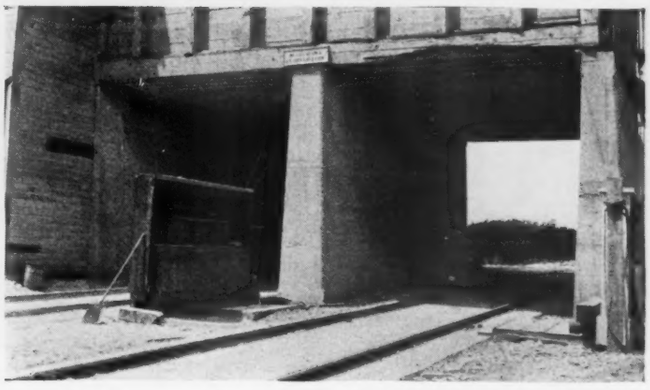
A tunnel connects the old quarry, worked in former years, with the present site.

It is really surprising how the shovels are always kept going and there always seems to be stone at the foot of the crusher incline. The policy is to keep the locomotives going at all times. If there is only one empty car, that car is taken to the shovel. This may tend to make the traveling cost rather high but it is more than offset by keeping the shovel working continuously. The company has 12 quarry cars in all. It has also found the operation of the locomotives very economical. Being powered with Fordson engines, repairs are easily made and parts can be purchased anywhere.

Cars at crusher incline

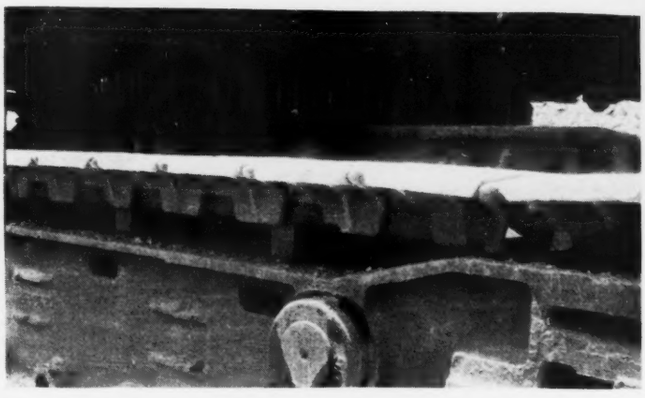
Loaded cars of stone are hauled up the incline and end-dumped into a No. 8 Allis-Chalmers gyratory crusher. A car goes up the incline once every minute; this includes hooking and unhooking the cable, as well as dumping. The discharge from the primary crusher is reclaimed by a 32-in. bucket elevator, 72 ft. centers. This discharges to two Allis-Chalmers scalping screens, 48 in.x16 ft. The screens have 2, 2½ and 3 in. perforations and two dust jackets, 1¼ in. and ¼ in. Stone 3 in. and over is discharged to a 24 in. x46 ft. centers belt conveyor, which deposits to a hoppered bin. From here the stone can be sent to either a No. 5 or No. 6 Allis-Chalmers crusher or back to the primary crusher. All three crushers discharge to the main bucket elevator and



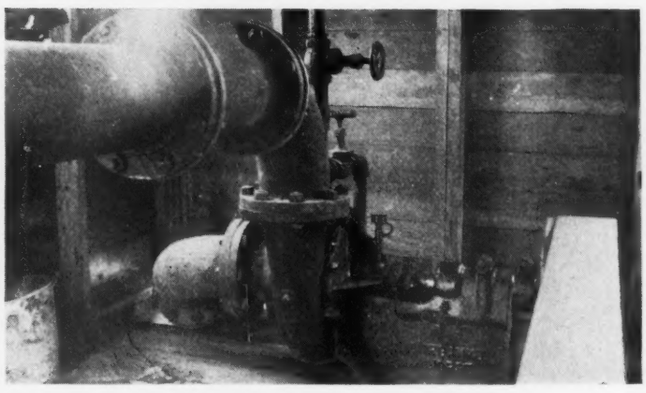


Left—Main jackshaft which drives all machinery in crushing and screening plant. Right—Loading bins and track scales. Cars go by gravity to and from the bins

Left—Cars and locomotive for hauling stone to crusher incline. Right—Electric shovel in action. Note stratification of the rock



Left—Direct-current generator in electric shovel. Right—The white dots are alemite caps which lubricate the shovel



Left—Main crusher and reclaiming elevator. Note that oil-reservoir for crusher has been embedded in the concrete foundation. Right—Six-inch centrifugal pump, belt-connected with 40-hp. motor, used for draining quarry

Left—Armstrong drill sharpener in machine shop. Right—Tunnel connecting present quarry with plant incline

John Owens, superintendent

the stone is sent through the scalper once more. Stone 1 in. and under is shunted to a 32 in.x12 ft. revolving screen fitted with ⅝ in. and ¼ in. dust jackets. This prepares agricultural limestone (¼ in. and under.).

All the chutes leading to the bins are constructed with butterfly valves so that any desired mixture can be put in a bin. The chutes are made of wood, steel lined, and are bolted together so that in case repairs are necessary the whole chute doesn't have to be torn down. The bolts are removed very easily, necessary repairs made, and the chutes put back into place again.

The crushing plant is powered with a 300 h. p. Corliss engine which drives the main jackshaft from which all machinery is driven. Two 150 h. p. boilers generate steam for the engine.

Cars for loading move by gravity underneath the bin. There is one track under each bin section and each one is provided with a 150,000 lb. capacity Fairbanks-Morse track scale. Thus each car of stone is weighed before it leaves the plant. This not only facilitates quick shipment but avoids under or overweight cars which cause considerable trouble to plants not fitted with scales. The track scales are further discussed under Hints and Helps for Superintendents in the August 8 issue.

The plant has quite a complete machine shop where ordinary repairs can be made and an Armstrong drill sharpener. It is located on a branch line of the Chicago and Northwestern R. R. but has switching facilities to the I. C. R. R. and the C. R. & P. R. R. The capacity of the plant is 1,000 tons per 10-hour day.

R. C. Fletcher is vice-president and general manager; Geo. Lane, general superintendent, and John Owens, superintendent. Mr. Fletcher makes his headquarters in Des Moines. Under his management the Iowa Limestone Co. will continue to grow and it will be worth watching.

Rock Dust as Preventive of Coal-Mine Explosions Being Slowly Adopted

EXPLOSION disasters in bituminous coal mines with their toll of miners' lives continue to recurr at an alarming rate. Coal dust is the principal agent in propagating explosions in bituminous mines. Explosion disasters, causing 979 fatalities in 1922, 1923 and 1924 were traced to coal dust as a cause. Tests conducted at the experimental mine of the Bureau of Mines, Department of Commerce, at Pittsburgh, Pa., have established the fact that a mixture of 60% to 75% of a non-inflammable dust with the coal dust will effectively blanket and prevent a dust explosion. This conclusion has been verified by actual mine practice in France and England, and to a limited extent in this country. Consequently the Bureau of Mines is using every means at its command to encourage wider use of the dusting of coal mines. This consists in applying inert rock dust to the walls and floors of mines in such quantity that dust explosions will be prevented from igniting or an incipient explosion will be effectually smothered. As a result of the activities of the bureau and other agencies it was reported in February, 1925, that 42 American coal mines had adopted the dusting method.

A wide extension of coal mine dusting demands a tremendous tonnage of dusting material. The location of a source of supply is one of the first problems that confronts the coal-mine operator. For better observation of the accumulating coal dust, and for effect of illumination, the dust should be light in color. To safeguard the miner's health the dust must be low in silica. The price must be very moderate or the cost of dusting will be prohibitive. Coal mine roof shale is widely used in Eugland, but most American roof shales are too sandy for use. Therefore, coal mines must for the most part seek outside sources of supply. Limestone, gypsum and anhydrite are materials that admirably fulfill the necessary conditions imposed and limestone in particular is widely distributed in most of the coal mining regions. In order to assist coal-mine operators in obtaining the necessary rock dust the Nonmetallic Experiment Station of the Bureau of Mines at New Brunswick, N. J., has prepared a report with a series of 15 maps indicating the location of limestone quarries and gypsum mines that may supply the desired materials. The maps cover the chief soft coal mining regions of the country. There is indicated on each map the active coal mining regions and also the limestone quarries and gypsum mines that have been developed in districts near the coal mines. As graphically presented on the maps, hundreds of sources of supply are available and their locations are within easy distance of most of the active coal mines. The report which supplies such data, Bulletin 247, entitled "Sources of limestone, gypsum and anhydrite for coal mine dusting to prevent explosions," may be obtained upon request from the Bureau of Mines, Department of Commerce, Washington, D. C.

Moler Quarry Wins Safety Trophy

THE Moler quarry of the Keystone Limestone Co., located at Millville, W. Va., has been awarded the bronze safety trophy offered by the Limestone Companies of the Carnegie Steel Co. to the plant having the fewest number of lost time accidents among its employes during the year 1924.

A continuous contest among the 14 mines and quarries of the limestone companies is in force from January to December of each year, various prizes being given to individuals for safety suggestions, etc. The winning of this trophy by Moler plant, which employed a monthly force averaging approximately 150 men during 1924 is considered an accomplishment of which to be proud, and is a reward to this plant for its efforts in accident prevention work extending over a number of years. The safety work at Moler is headed by General Superintendent N. B. Scott and Superintendent J. H. Robinson, both taking an active part.

The plant safety organization consists of a safety committee, composed of permanent and rotating members, and a blasters' school, which organizations meet during the month, the safety committee to discuss possible improvements and methods for protection of their fellow workers and the blasters' school to study the safe use of explosives. Great interest is manifested by these committees and through their efforts accidents at Moler plant have been reduced to a minimum.—*Hagerstown (Md.) Mail.*

Gypsum in China

C. Y. HSICH and C. C. Liu, geologists of the National Geological Survey of China, are the authors of a recently published monograph on the Yin Ch'eng gypsum and salt deposit of Western Central Hupei. The text of the book is largely in Chinese characters but the first ten pages are in English.

The production of the district is about 86,000 tons per year. This is crude rock about half of which is used as land plaster. The next most important use is in portland cement which takes about 10,000 tons. Other uses are for making chalk, bean curd, tooth powder and in paint and medicine and for making plaster models. From 5000 to 7000 tons are exported to Japan, Hong Kong and Java. The book is published by the Hupei Industrial Bureau, Wuchang, China.

Panorama of the Winchester, Mass., crushing plant and part of quarry of the General Crushed Stone Co. at the moment of a typical blast

Winchester (Massachusetts) Quarry of the General Crushed Stone Company

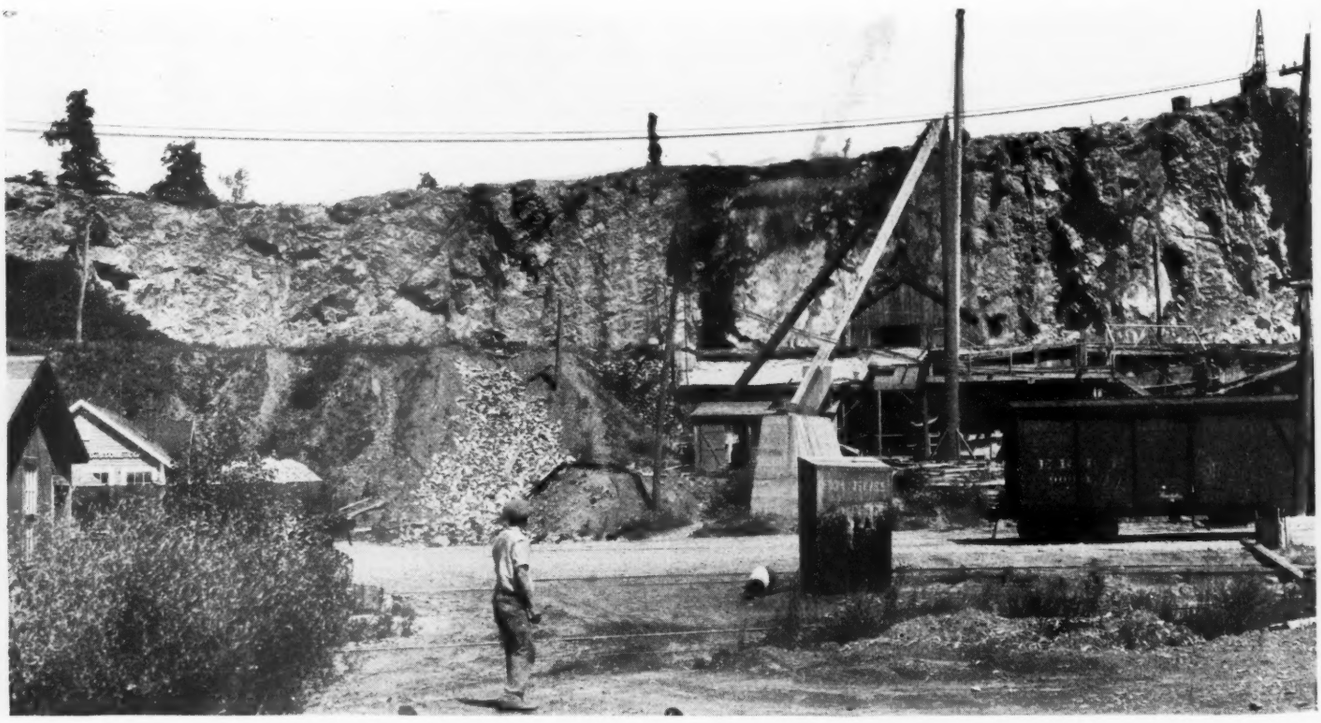
Where the Issue of Damaging Earth Shocks from Blasting Operations Was Fought to a Near Finish

By Nathan C. Rockwood
Editor-Manager, Rock Products

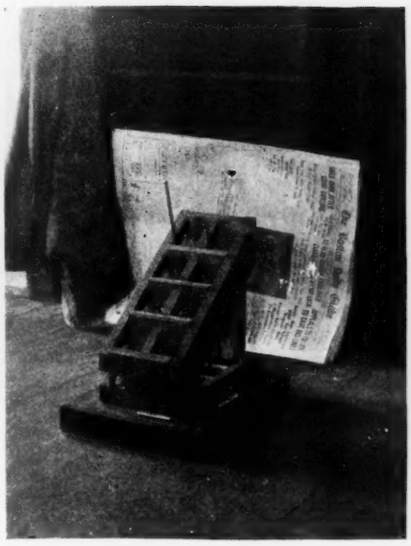
QUARRY MEN who attended the annual conventions of the National Crushed Stone Association at Chicago in 1923, and St. Louis in 1924, or read the reports of the proceedings published in ROCK PRODUCTS, will doubtless recall the interesting discussion by Otho M. Graves of the blasting problem of the General Crushed Stone Co. at its Winchester (Mass.) quarry.

When this company took over the property in 1919 it took over at the same time a controversy with its neighbors who had been collecting the costs of alleged damages from blasting operations for years, and who tried to take advantage of the new owners to greatly increase their claims, both in number and amount.

Instead of handing out money promiscuously to complainants the General Crushed Stone Co. contested these claims, hired experts, made seismologic investigations and



One of the four blasts at the Winchester quarry on July 30, described in the article



Device for testing earth shock or tremble from blasting

records; and fought the case out in the courts. Many volumes of evidence were taken and these constitute the most complete and important record of research ever made in this particular field of quarry-operation problems.

As seismographs are very sensitive and expensive instruments and require an expert to set them up and interpret results, it is not feasible to use them continuously. However, in connection with the seismologic investigation a simple device was developed at the plant, consisting of eight steel pins, of different lengths from about 2 to 15 in., about ¼ or 5/16 in. in diameter. The ends of these pins are machined to as perfect a plane surface as possible. They stand in a rack, as illustrated in one of the views, on base plates, which are also as nearly perfect horizontal planes as it is possible to make them. A pair of spirit levels is provided on the base of the rack so that the whole may be set up in a horizontal plane.

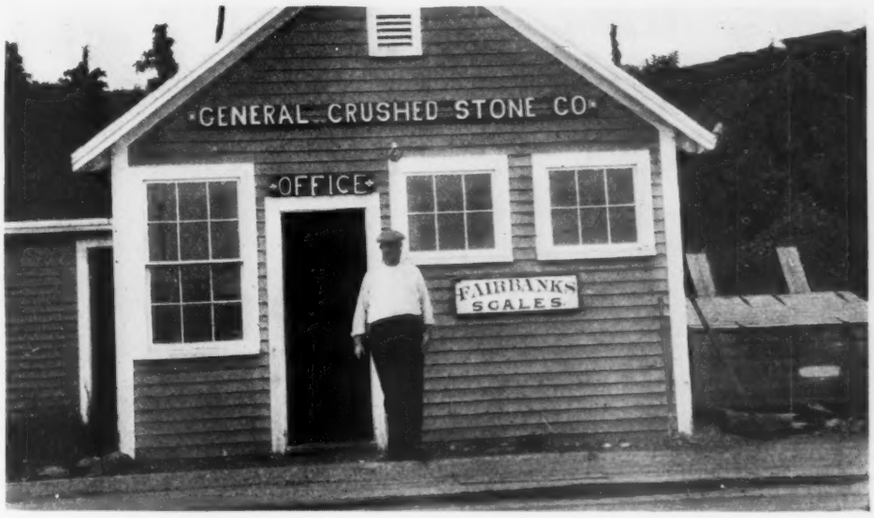
It is obvious that a slight earth tremor will cause the pins to topple over, the tallest one easiest, and so on down the line. These falls and tremors have been calibrated, or compared, with a seismographic record so that the results are within a certain degree of accuracy comparable.

So now whenever a shot is made in the quarry two of these pin sets are erected at the office and in some other location near the quarry, and a record of results kept. The writer witnessed one such test on one blast July 30 when three holes containing 1600 lb. of explosive were shot. Not a single pin was disturbed. Nevertheless a phone call was received shortly afterward by a lady neighbor to the effect that the blast "had bent the water pipes in her basement."

This was one of four blasts of equal size shot on the same day. Of course, ordinarily at any other quarry, the 12 holes

Returning to work after one of the four shots on July 30

General Manager Otho M. Graves (second from right) and the office force at Winchester; Thos. A. Lanagan, Boston sales manager in doorway; M. V. McKeon, superintendent, end right



Superintendent M. V. McKeon of the Winchester plant and the office

would have been shot at one time. As it was the shooting required possibly three hours' time; the holes being shot in succession, three at a time, requiring the quarry crew to abandon their work for each shot. So far as could be seen just as good results were obtained as if the 12 holes had been shot at one time.

The defense of these damage suits has cost the General Crushed Stone Co. around $40,000, and if we understand correctly, a conclusive decision was never obtained. The particular test case was ended when it was proved that the property alleged to be damaged by blasting was sold during the controversy. However, the case was in every way a moral triumph for the General Crushed Stone Co. officials and their opponent could have been legitimately accused of perjury.

Now, however, the company is on better terms with its neighbors, as often happens when one proves himself not to be such an easy mark as anticipated; and no more trouble is in sight. The company defended itself as a matter of principle and since its officials have never shown any disposition to be unfair in any of their relations with surrounding property owners, we presume that they now have the wholesome respect and good-will of most of these people, as naturally follows such tactics.

Everyone who has seen and heard Otho M. Graves, general manager of the General Crushed Stone Co., now president of the National Crushed Stone Association, in action at the association conventions must have surmised that his eloquence and ready logic could not have been acquired without considerable practice and experience. His knowledge of human nature is large and intimate; and perhaps no small part of it has been acquired in attending city council meetings, court sessions and so forth during the three or four years of controversy over the Winchester quarry blasting.

So hereafter when we hear President Graves pour forth eloquence and wisdom with little apparent effort, just bear in mind that his experience includes besides several years as a college professor of engineering, a broader knowledge of law, politics and human nature than most men acquire in a life time of public service.

City Officials Witness Winchester Blasting Operations

AN interesting supplement to the foregoing is a clipping from the Woburn (Mass.) *Times* of August 6 which gives the impressions of the Woburn city officials on the same blasting operations at Winchester, described in the foregoing article, but conducted one week later—August 6. Woburn and Winchester are adjoining cities; the boundary line passes through the General Crushed Stone Co. property. The newspaper referred to reports:

Four explosions by the General Crushed Stone Co. dislodged 35,000 tons of stone at the quarry of the company, this morning, while Mayor Thomas H. Duffy, members of the city council and officials of the company stood 400 ft. from the blasts to witness the effects. The city officials' presence at the scene was due to the complaints received by the residents of the Highlands district last week during the last blasting activity.

The largest blast contained 1600 lb. of dynamite, the maximum allowed by the commissioner of public safety. The officials and spectators were somewhat disappointed in the effect, because the expected shower of bricks and rocks did not materialize. Instead, the earth heaved, and rumbled slightly, and then the avalanche of stone and earth slid down the side of the quarry to the level below. The only spectacular sight in the entire blasting operations occurred during the heavy explosion, when a boulder, estimated to weigh 160 tons, was loosened and like the much smaller stone tumbled to the level below.

The mayor and council members standing at a 400-ft. distance were not excited when the explosions went off, a slight trembling of the earth having been the only effect felt by the official party. Besides Mayor Duffy, there were President Michael J. Curran, Ald. William H. Crowley, Thomas P. Callahan, James J. Wall, Francis M. McGarry and City Clerk James A. McLaughlin.

The company officials arranged tests of the vibration with small boxes of steel pins (described in foregoing article). Not one of the pins were turned over.

However, according to residents of the hill district, the rumbling of the earth could be felt distinctly, although many of the residents asserted that the effects was not as bad as the blast of last week. The storekeepers in the center said that during three of the blasts there was a slight rocking of the buildings.

Crushed Stone Production

TOTAL production of crushed stone in the United States in 1924 amounted to 67,400,000 short tons, valued at $73,700,000, according to a preliminary compilation of reports from producers made by the Bureau of Mines, Department of Commerce. The figures indicate an increase of 8% in quantity over 1923, although final figures may show a somewhat higher percentage gain.

Crushed stone for concrete and road work amounted to 56,900,000 tons, valued at $64,900,000, an increase of 11% in quantity and crushed stone reported as used for railroad ballast was 10,500,000 tons, valued at $8,800,000, a decrease of about 7%.

Stone sold for fluxing to blast furnaces, open hearth steel works, smelters, and other metallurgical plants, amounted to about 19,860,000 short tons, valued at $15,888,000, a decrease of 22% in quantity.

Stone for refractory use, which includes dolomite, quartzite, and mica schist, amounted to 988,000 tons, valued at $1,302,000, a decrease in quantity of 14%, and reflects, as does the decrease in fluxing stone, the lessened activities of metallurgical furnaces. Raw dolomite reported as sold for the manufacture of refractories amounted to about 203,000 short tons, valued at $200,000. Besides this quantity, operators who both quarry and dead-burn or sinter dolomite, reported 328,700 tons of sintered material, valued at $3,161,000. The quantity of raw dolomite reported was about the same as in 1923, and the sintered material decreased 8%. Quartzite (ganister) used in the manufacture of refractory brick, for furnace lining and for the manufacture of ferro-silicon, amounted to 756,630 short tons, valued at $981,906.

Sales in 1924 of pulverized limestone for agricultural use amounted to about 1,332,000 tons, valued at $1,938,000, an increase of 4% in quantity over the sales for 1923.

STONE SOLD OR USED BY THE PRODUCERS IN THE UNITED STATES, 1923 AND 1924, BY USES

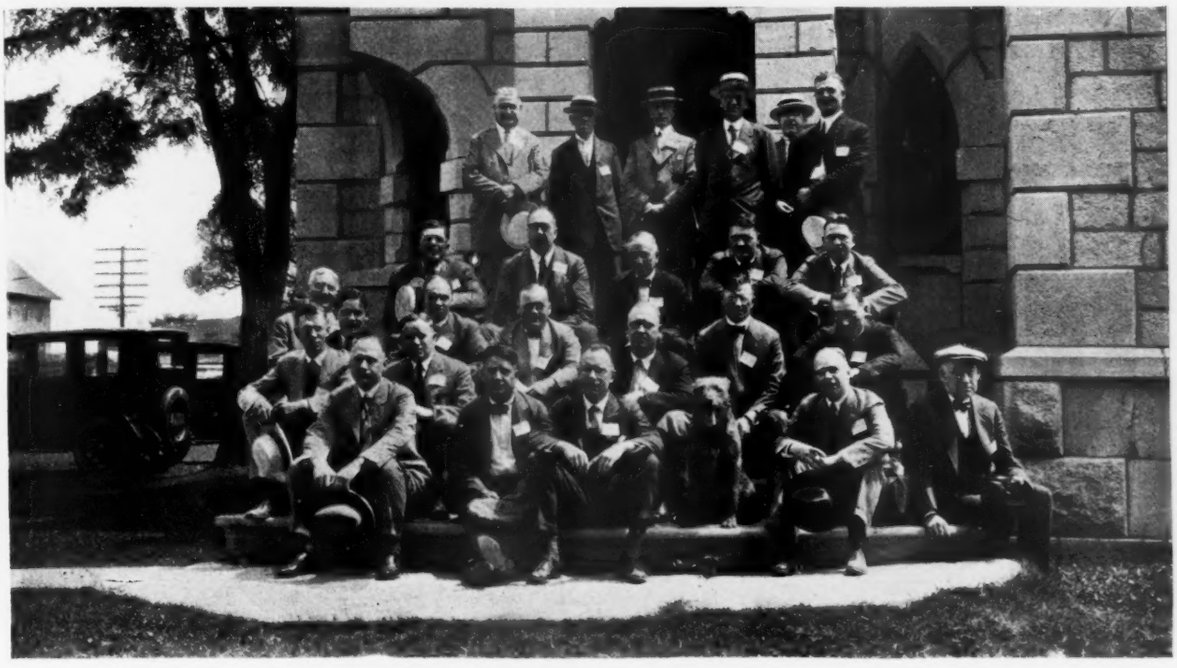
Use	1923 Quantity	1923 Value	1924 (estimate) Quantity	1924 (estimate) Value
Building stone, cubic feet	26,515,520	$ 32,416,717	27,860,000	$ 32,270,000
Approximate equivalent in short tons	2,067,030		2,113,000	
Monumental stone, cubic feet	5,108,650	16,213,230	4,740,000	15,192,000
Approximate equivalent in short tons	424,310		396,000	
Paving blocks, number	45,866,480	4,003,490	40,883,000	3,568,000
Approximate equivalent in short tons	462,210		375,000	
Curbing, cubic feet	3,227,810	2,936,313	3,794,000	3,458,000
Approximate equivalent in short tons	252,300		294,000	
Flagging, cubic feet	607,600	422,059	809,000	558,000
Approximate equivalent in short tons	43,860		60,000	
Rubble, short tons	882,010	1,298,050	880,000	1,250,000
Riprap, short tons	3,185,900	2,989,068	3,000,000	2,750,000
Crushed stone, short tons	62,322,710	67,928,651	67,400,000	73,700,000
Furnace flux (limestone and marble), short tons	25,602,450	20,377,138	19,860,000	15,888,000
Refractory stone (ganister, mica schist, and dolomite), short tons	1,151,900	1,572,794	988,000	1,302,000
Manufacturing industries (limestone and marble), short tons	4,668,470	4,224,230 }		
Other uses*, short tons	2,264,310	5,565,501 }	7,000,000	10,000,000
Total (quantities approximate, in short tons)	103,327,460	$159,947,241	102,366,000	$159,936,000

*Chiefly agricultural limestone.

E. B. Johnson, of the Adams and Duford Co., explains geology of region

New York State Quarry Men Visit Watertown and Chaumont

Watertown Stone Products Company and Adams and Duford Company Plants Are Inspected



Group of New York State crushed-stone producers on the steps of the Adams and Duford Co. office building at Chaumont

Crushing plant of Adams and Duford at Chaumont, N. Y.; probably the only plant on the United States side of Lake Ontario equipped to make lake shipments

Crushing plant of the Watertown Stone Products Co., near Watertown, N. Y. showing group of visiting quarry men on inspection tour

Part of the quarry of the Watertown Stone Products Co. showing Fordson tractor on flanged wheels used for motive power

Another view of the Watertown Stone Products Co. showing one of two electric shovels

ON July 31 the members of the New York Crushed Stone Association, in accordance with a custom of several years' standing, held a monthly meeting in the home town of one of the members and spent a good share of the allotted time inspecting two plants which had not previously been visited. The place chosen for the meeting was Chaumont, at the eastern end of Lake Ontario, the home of the Adams and Duford Co., limestone quarrymen, and the other plant visited was that of the Watertown Stone Products Co., near Watertown.

A luncheon was served by the Adams and Duford Co. at Chaumont and the meeting was held at the Chaumont Yacht Club. A. W. Adams and E. B. Johnson of the Adams and Duford Co. and S. D. Ormsby of the Watertown Stone Products Co., proved admirable hosts, and with a fine day in such a beautiful country everybody thoroughly enjoyed himself.

The principal business of the meeting was to lay before the New York State Crushed Stone Association the results of a recent directors' meeting of the National Crushed Stone Association. President Otho M. Graves of the National Association did this in such an admirable manner that the plans of the National Association for an enlarged program of engineering and research work were enthusiastically endorsed and adequate financial support promised.

Plant of the Watertown Stone Products Co.

The plant of the Watertown Stone Products Co. was found to be new and interesting. The quarry has been opened up as a long narrow cut, excavation being done by two 20-ton, ¾-yd. Thew electric shovels. Drilling is done with a Loomis electrically-operated well drill. Transportation is taken care of with one Fordson tractor, with the usual tractor wheels replaced by two large flanged wheels. But one 4-yd. rocker-type, steel quarry car is hauled at a time, and the ground covered by the locomotive is remarkable. It is the speediest quarry locomotive the writer has ever seen.

The "neck of the bottle" in this plant is the long incline to the primary crusher. The quarry cars are hauled up one at a time and the capacity of the crushing plant is thus limited to 250 or 300 yd. a day, in spite of a shovel capacity of several times this yardage. Night work has been necessary to catch up on orders. Mr. Ormsby received many helpful suggestions from his visitors, and it is probable that he will increase his output by installing a new primary breaker on his quarry floor, using a belt conveyor on the incline.

One of the features of the Watertown plant which attracted much interest from the visiting quarry men was a new Armstrong well-drill sharpening machine. This was in use, with an oil-fired forge, and was well recommended by Mr. Ormsby.

The limestone is a hard, pure high calcium rock, gray in color. A limestone pulverizing

plant has recently been added, and a considerable business in agricultural stone dust is being developed.

Adams and Duford Co. Plant

The Adams and Duford Co. has operated limestone quarries at Chaumont for many years. The limestone is a remarkably hard durable stone of practically pure calcium carbonate. For many years it was quarried for dimension stone, and the office of the company is an example of its architectural possibilities.

Of recent years the business has been all in crushed stone. The quarry and crushing plant is near the shore of Lake Ontario and lake-shipping facilities are provided by a connecting canal. The quarry is, so far as we know, the only one on the American side of Lake Ontario which may ship direct by water. The stone has been much used by U. S. government engineers on harbor and breakwater work.

The quarry is both hand and steam-shovel operated.

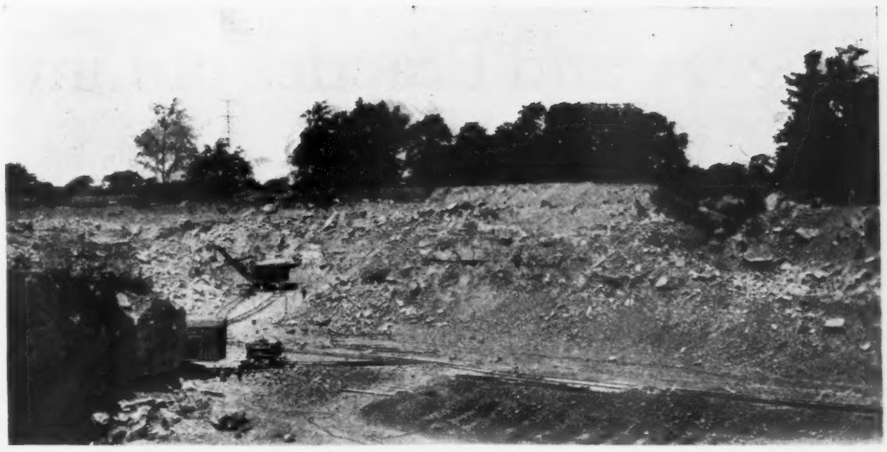
Preventing Coal-Dust Mine Explosions

AN important step in the prevention of explosions in coal mines has been taken by the formulation, through the co-operative effort of all interested groups, of a comprehensive code for rock-dusting coal mines, according to an announcement by the American Engineering Standards Committee. Catastrophes due to coal mine explosions can be prevented by the simple expedient of spreading rock-dust thickly enough to cause an incipient coal dust explosion to die out rather than to travel through the mine atmosphere.

The code is now practically completed and it is expected that it will be formally approved and issued in the near future. The code prescribes the rock-dusting of mines producing bituminous coal, or lignite, whether gaseous or not, as they are liable to dust explosions.

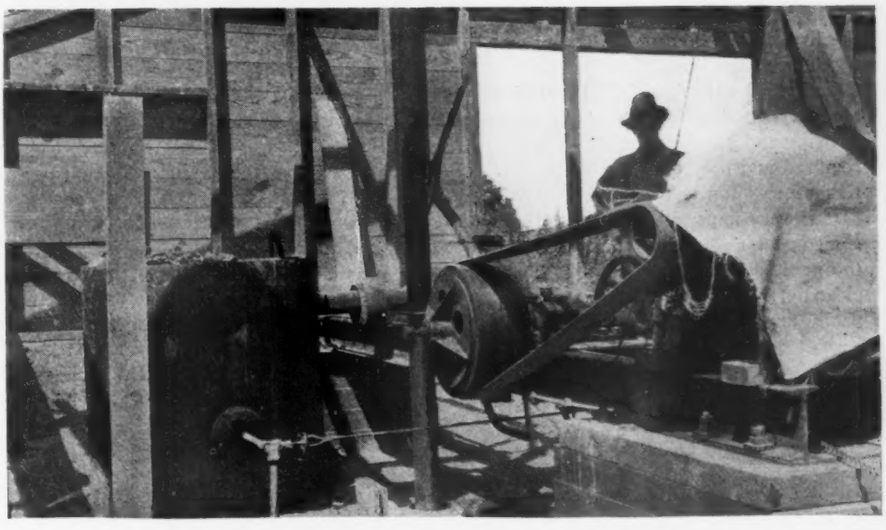
The kind of dust to be used is specified as to its nature, fineness and moisture absorbing qualities, since caking destroys its effectiveness. The parts of the mine to be dusted, the methods of applying the dust, and the amounts are indicated. Instructions for sampling the dust for inspection purposes are given.

The technical committee which has formulated the code is made up of representatives of the various national bodies interested, acting under the sponsorship of the American Institute of Mining and Metallurgical Engineers. The groups co-operating and represented on the committee include state officials having regulatory power over the field in question, coal operators, labor, inspection, insurance, and manufacturers of mine equipment, and the U. S. Bureau of Mines which, as a leader in mine safety work, has made extensive investigations.



Another view of Watertown Stone Products Co. quarry showing both shovels

Close-up of new electric revolving shovel and Fordson tractor and quarry car



Well-drill-sharpening machine showing oil-burner forge

Theory and Practice of Lime Manufacture*

Part V—Reduction of Kiln Efficiency During Drawing—Reversed Circulation

By Victor J. Azbe
Consulting Combustion Engineer, St. Louis, Mo.

PART IV of this series, which was published August 8, told how the performance of a lime kiln might be judged by the analysis of the kiln gases. It included an ingenious "master chart" by which the "kiln thermal efficiency" and the "ratio of fuel to lime produced" may be read from the chart without going to the trouble of calculation. The present number discusses the maintenance of kiln efficiency.

The conditions in a lime kiln, as judged in part from the charts given in this section of the paper, are very complex and with a direct-fired kiln, it is impossible to maintain conditions just right. They only can be approximated.

Reduction of Kiln Efficiency During Drawing Period

Fig. 12 illustrates firing conditions in three different plants during drawing periods. Plant A and B are hand fired, Plant C is gas fired. In the case of Plant A, it took 102 minutes to draw the kiln and clean the grates. In Plant B it was even worse and the time required was 150 minutes at the time observation was made. During part of this time whatever coal there was burned, was burned very inefficiently. During part of the time, all heat generated was wasted and during the greater part not only no heat was obtained from the gases of combustion, but actually since they were cooler than the lime on account of the great excess of air, the condition of reverse heat flow took place and the lime in the kiln heated the gas passing up through the lime.

Compared with A and B, Plant C results are very good. For the entire period of drawing and punching, only 24 minutes were required and only during a very short portion of this time oxygen went high.

It is very important that a kiln be so designed and so operated that there are not too great interruptions due to drawing and cleaning, otherwise, kiln efficiency and capacity are greatly reduced.

Lime Kiln Heat Transfer

A lime kiln is as much a heat transfer apparatus as a boiler or a radiator. Heat transfer occurs from the hot flame and hot gas to the lime and limestone by convection and radiation, then it passes by conduction to the inner layers.

Heat transfer by radiation depends upon temperature difference and relative luminosity of the two heat interchanging objects. It will vary as the fourth power of the absolute temperature difference, and the radiated heat will penetrate to the surface of lime through the insulating layer of cooler gas at the speed of the light.

The rate of heat transfer by convection depends upon temperature difference and gas velocity. The higher either is, the higher will be the heat transfer. Convection heat transfer is impeded by the insulating value of the cooled gas next to the lime so the higher the velocity or turbulency,

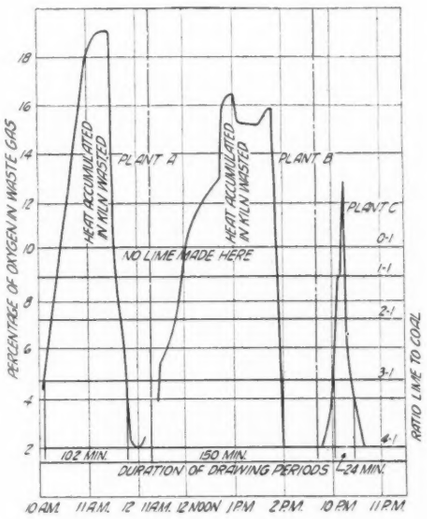


Fig. 12. Firing conditions at three different plants during drawing period

the faster will the cooled film be swept off and substituted by a better film. Convection heat transfer is independent of radiation heat transfer and vice versa, excepting that if a surface becomes heated by radiation, it will receive less heat by convection.

Heat transfer through lime and limestone depends upon its heat conductivity which is a fixed figure for a certain stone or lime. Through limestone, the conductivity will be greater, due to its solidity but may vary some with different stones due to their difference in physical makeup. Through lime, the conductivity will be less than through stone due to its porosity and consequent occlusion of gas particles which act as a heat insulating medium. It will also vary more and will depend in the main upon the size of the pores.

A luminous flame will transfer much more heat than a non-luminous flame because heat transfer by radiation is not impeded. A non-luminous flame will transfer 2 B.t.u. or more per square foot per hour per degree difference in temperature. With the usual figure that may apply to lime kilns this rule is 5 B.t.u. A highly luminous flame may have a heat transfer rate of 20 B.t.u. or four times as great. This relative heat transfer is very important in lime kilns and a luminous flame is to be greatly preferred.

Flame luminosity is caused by small highly heated particles of carbon in the gas, and these cannot be present except combustion is retarded. If too much air is used or if the mixture of air and combustible gas is very intimate, the flame may be very short and non-luminous. Almost all heat then will have to be transferred by convection.

The writer tested kilns having efficient fuel burning equipment and combustion was very good. Still results were poorer than was the case in the kiln where coal burning equipment was poor, but such that combustion was retarded and high flame luminosity obtained.

A kiln properly designed for retarded combustion will make better lime and more lime because heat transfer will be greater in spite of lower temperature difference. Then, the kiln life will be longer because heat will be used as it is generated, thus cutting down local high temperatures such as are often found in front of kiln eyes.

A luminous flame to be effective in lime kiln, must, however, be long enough to penetrate up to where the partially burned limestone is. To have a luminous flame in the kiln immediately on the level of the eyes helps little since the lime there is completely burned with little if any core in it and is practically at the same temperature as the flame, and highly luminous, so a heat transfer by radiation cannot take place. Under these conditions, often before the gas reached the points where luminosity would help the carbon particles are burned out and the flame luminosity insufficient for any good.

It is due to the desirability of having retarded combustion, that the absence of hydrogen gas to as great an extent as possible

becomes important. This gas burns at great speed—about twice as fast as carbon monoxide, and it is said 15 times as fast as methane.

For high rates of heat transfer by convection, it is necessary that gas velocity be high. If gas velocity is high, draft drop will be greater, also the gas will stay in the kiln a proportionately shorter time, so if high heat transfer by convection is wanted, the kiln must be designed with that in view, otherwise the heat transfer will be great, but terminal temperatures on kiln top too high or draft drop too great. This will be again discussed in section dealing with "Factors Affecting Kiln Capacity."

Reversed Circulation

It may be further mentioned that there are cases when there is a reversed circulation of gas in a lime kiln. Reversed circulation in the preheating zone is quite frequent, and it is due to the fact that the tendency of cold air passing down is greater than the velocity energy of hot gas going up. It could also be said that the gas going up, selects preferential channels leaving others idle, through which the air passes down. At a point which may be as low as 20 ft. in the kiln, the two mix and pass up together at a greatly lower temperature, which reduces the temperature range to which stone is preheated in a certain distance of travel through the kiln. In Fig. 13, I attempted to demonstrate this contention. While I have proof that this occurs in the preheating zone, I have no such proof that it does occur in the burning zone, but if velocity is low, that is, the kiln is operated at a rate below its shaft area proportion, then I don't see why it should not occur, especially since draft differences are so small and neutral.

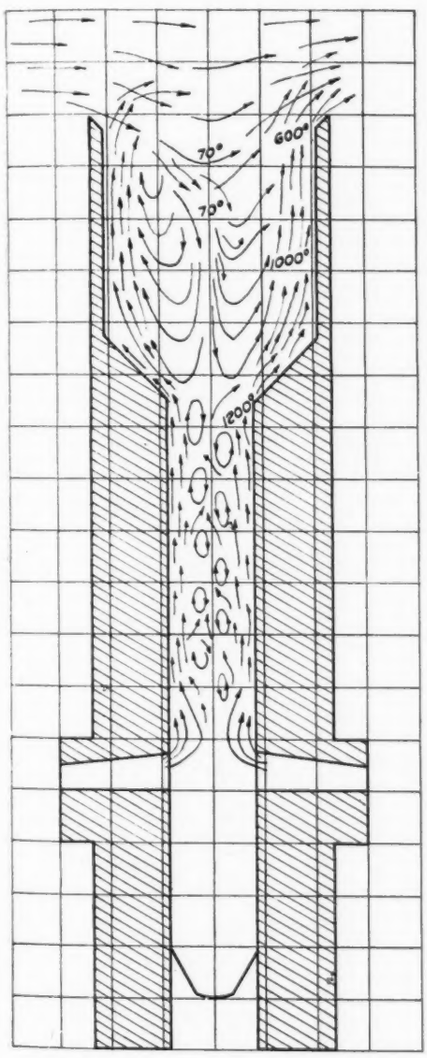


Fig. 13. Showing reversed circulation in preheating zone

(To be continued)

Gas Producer Reactions

IN view of the fact that gas producers are now finding application in lime manufacture and as many of the problems concerning the industry are either directly or indirectly connected with gas producer operation some knowledge and study of the reactions in and products of a gas producer is worth consideration. An article of "Reactions in the Fuel Bed of a Gas Producer" was published in the June issue of *Industrial and Engineering Chemistry*, a brief abstract of which follows:

Experiments were conducted in which the reactions in different zone of the fuel bed of a gas producer were studied by carefully sampling and analysing the gases. These analyses showed that the oxygen is first completely consumed in a very thin zone with the formation of carbon dioxide. This zone is called the combustion or oxidation zone and is about 3 or 4 in. thick just above the ashes. Contradictory to some previous views no water is decomposed until all the xoygen is consumed. As the hot gases pass out of this zone reduction begins forming carbon monoxide and hydrogen. The reactions that take place in this the "primary reduction zone" are:

$$C + H_2O = CO + H_2$$
$$C + 2H_2O = CO_2 + 2H_2$$
$$C + CO_2 = 2CO$$

This zone is about 12 in. thick and above this is what may be called the "secondary reduction zone" in which the chief reactions taking place to some extent are:

$$C + CO_2 = 2CO$$
$$CO + H_2O = CO_2 + H_2$$

After leaving the fuel bed the carbon monoxide which has formed shows a tendency to revert back to carbon dioxide and carbon as shown by the following equation, which is the reverse of a former one:

$$2CO = CO_2 + C$$

In the upper portion of the fuel bed distillation takes place by which the fuel is separated into coke and gaseous hydrocarbons.

All of these reactions are affected by the quantity of air present, temperature, pressure, condition and thickness of the fuel bed and the steam injected into the producer, all of these factors thus warrant consideration for efficient operation of the producer for desired results.

In an article in the July number of the *Industrial and Engineering Chemistry* entitled "The Combustion of Carbon," the influence of temperature and pressure on the $CO:CO_2$ ratio was stressed and statement made that carbon in the oxidation zone burns to carbon monoxide as well as carbon dioxide. The carbon monoxide content of the gas formed in the producer was increased by forcing air through a hot charcoal fuel bed even when layers as thin as 2 and 3 in. were used.

ZONE		FUNCTION	REACTIONS
Ash		Cooling of ash and preheating of air - steam blast	
Oxidation		1—Combustion of fuel	$C + O_2 = CO_2$
		2—Production of heat	
		3—Formation of CO_2	
Reduction	Primary	Reduction of CO_2 and decomposition of steam by carbon	$C + H_2O = CO + H_2$ $C + 2H_2O = CO_2 + 2H_2$ $C + CO_2 = 2CO$
	Secondary	1—Some reduction of CO_2 by carbon	$C + CO_2 = 2CO$
		2—Slight reduction of H_2O by CO	$CO + H_2O = CO_2 + H_2$
		3—Interchange of heat from gas to fuel	
Distillation		Separation of the fuel into coke and gaseous hydrocarbons	

Adhesion of Mortar to Sand-Lime Brick

COMPARATIVELY little work has been done on the adhesion of mortar to brick, although it has been recognized that the bond between mortar and brick is a factor contributing to the strength and performance of masonry. The problem, therefore, of determining the effect of various kinds of mortars for use with sand-lime brick was taken up by the bureau.

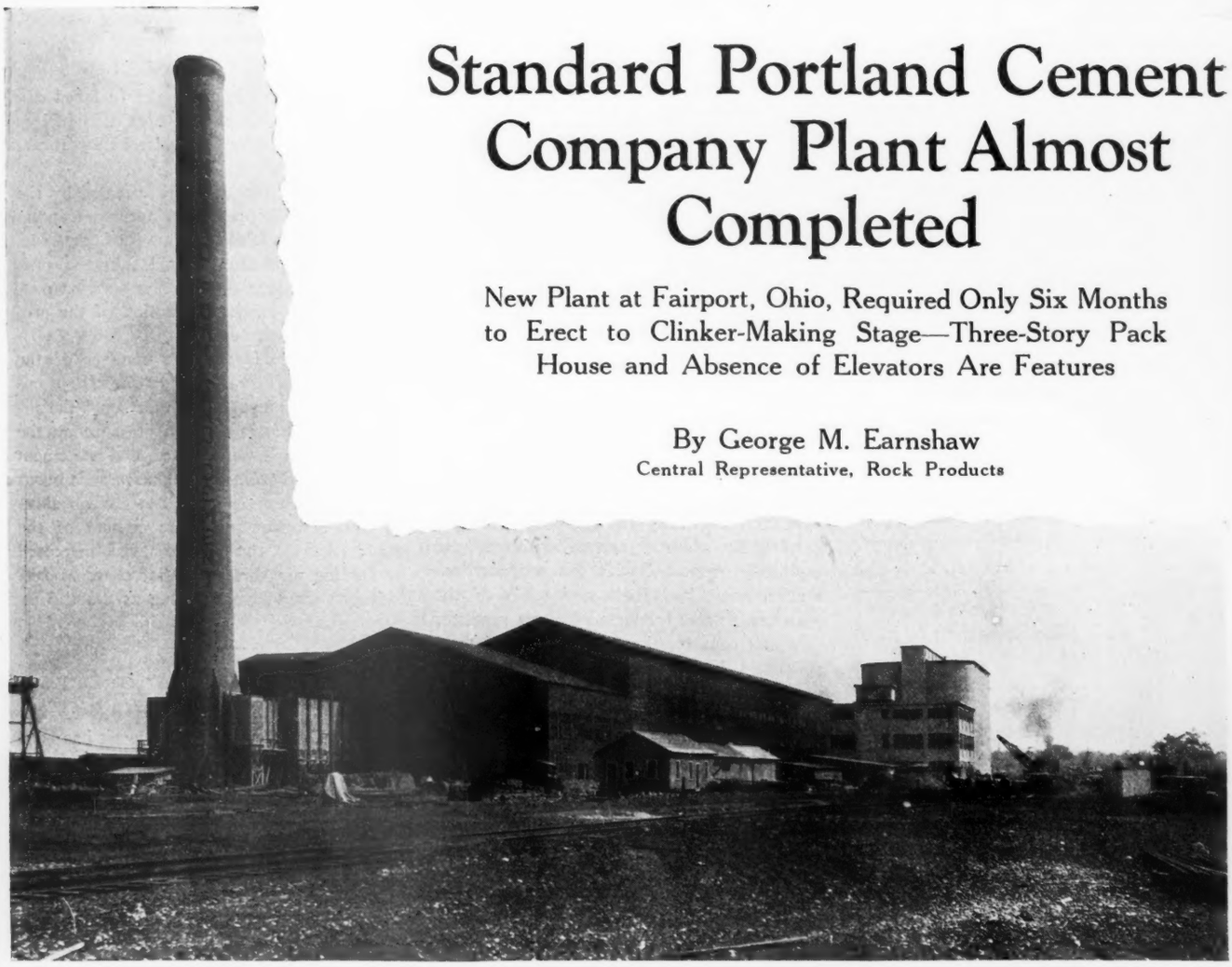
The total absorption and rate of absorption have been determined for 1100 sand-lime bricks, so that they can be arranged in groups of different absorptive capacities. In general, bricks of the highest total absorption show the most rapid rate of absorbing water.

Tests were made with a 1:3 cement mortar, where the percentage of water was varied, both in the bricks and in the mortar. Where the bricks were used dry, the mortar adhered to the brick first in contact with it. Where the bricks were wet the mortar adhered to the second brick. The results show that the strength of the bond between cement mortar and bricks is greater when bricks are wet rather than dry and when the mortar itself is quite wet.—*U. S. Bureau of Standards Report.*

Standard Portland Cement Company Plant Almost Completed

New Plant at Fairport, Ohio, Required Only Six Months to Erect to Clinker-Making Stage—Three-Story Pack House and Absence of Elevators Are Features

By George M. Earnshaw
Central Representative, Rock Products



New plant of the Standard Portland Co. at Fairport, Ohio, which was built in record time

IT was not until January of this year that it was decided to build a cement plant at Fairport, Ohio, to be known as the Ohio Portland Cement Co. On February 1, ground was broken and on August 3, an interim of six months, clinker was dropped into storage. In the meantime the company's name was changed to the Standard Portland Cement Co. At the time of the writer's visit at the plant (August 14), the raw end of the plant was in operation and preparations were almost completed for the starting of the finish department. It is expected that every unit in the plant will be in operation before September 1.

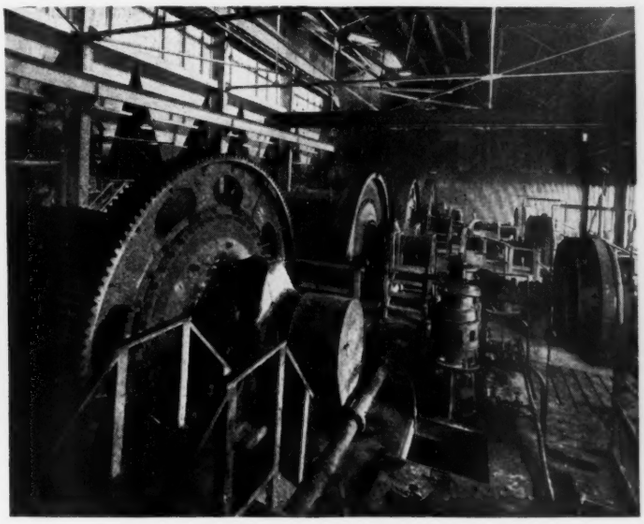
Because the plant adjoins the property and plant of the Diamond Alkali Co., some have gained the impression that the Standard Portland Cement Co. is a subsidiary company. Such an impression is erroneous. Neither is it true that the cement plant will make use of a waste product from the alkali plant.

The reasons for building at Fairport are, first, because a grade of limestone, too small for use by the alkali company, could be purchased at a very reasonable price; second, because powdered coal from the alkali company's coal pulverizing plant and power

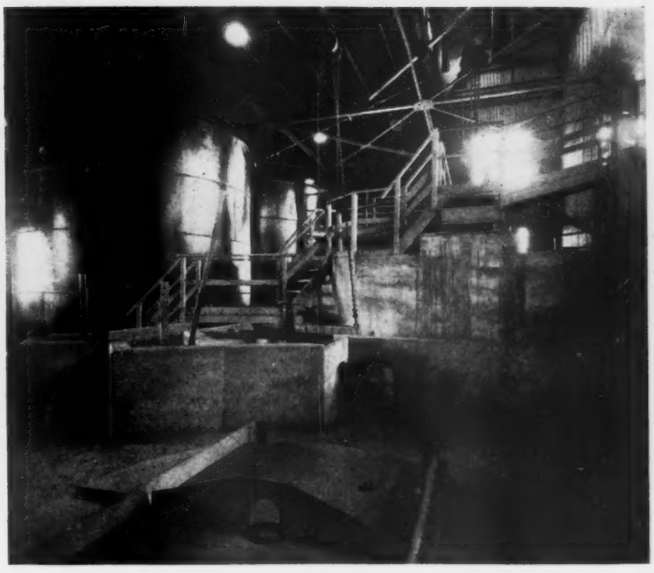
Pack house and reinforced-concrete silos having 150,000 bbl. capacity

View from the open end of the main raw storage building

Hammer mill and two pan conveyors on inlet and outlet

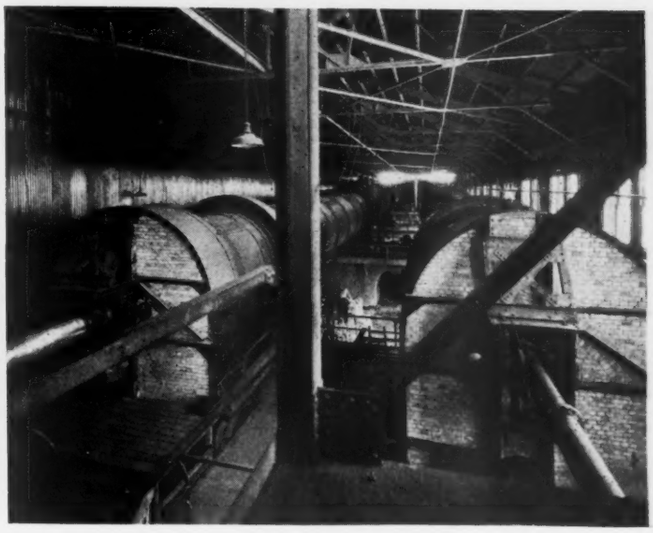


Battery of 7 x 26 compartment mills driven by 500-h.p. super-synchronous motors

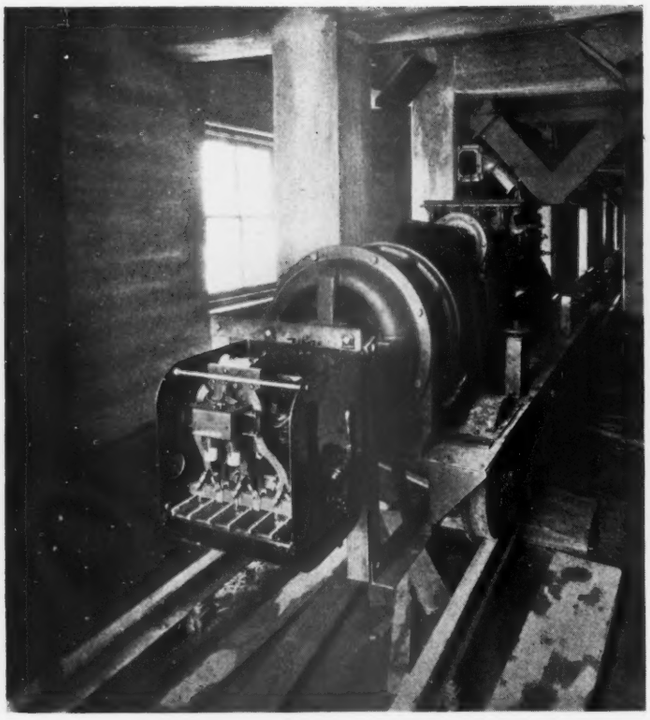


Clay wash mills and surplus clay-storage tanks

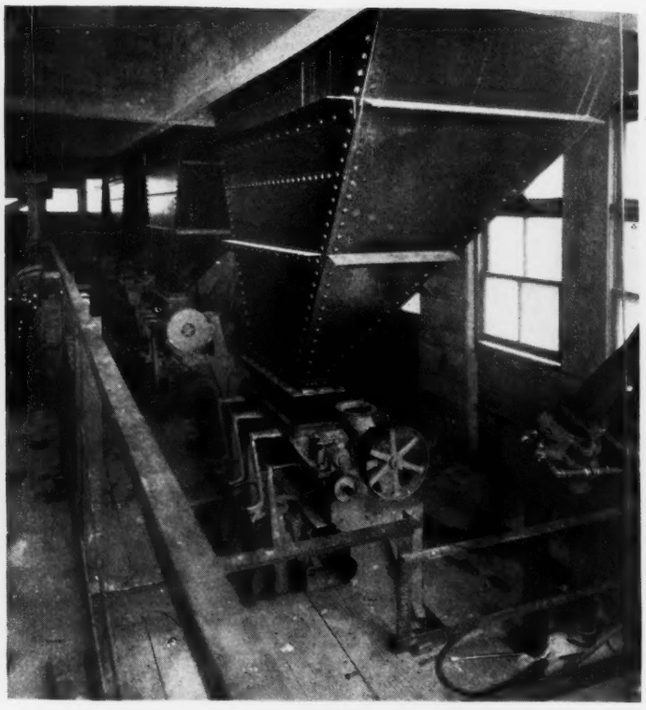
Double agitators on clay slurry basins and pumps (background)



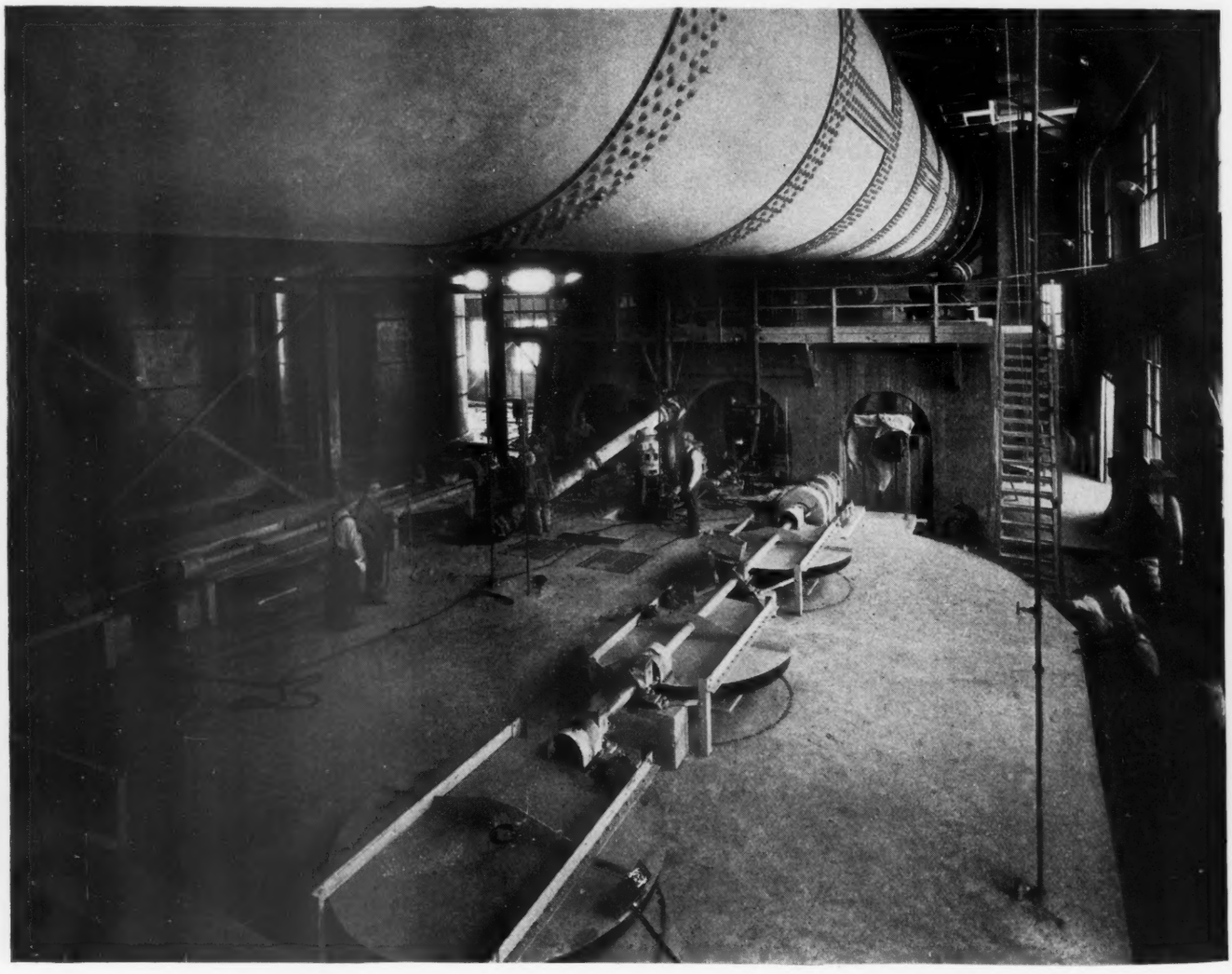
Two 10 x 240 ft. kilns with specially designed dust chambers



One of four Fuller-Kinyon pumps under cement silos



Discharge end of conveying system to packing machines



Two slurry kiln basins showing system of agita tion—at left, two of the six correction tanks

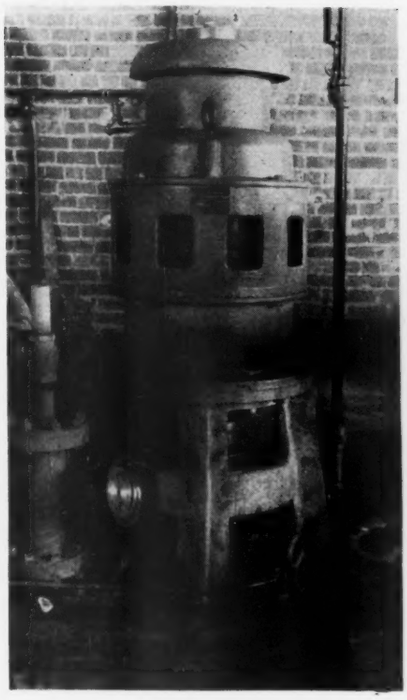
from their power plant, could likewise be purchased at a reasonable price, thereby eliminating the need of an expenditure for power plant and coal plant; and third, because of unusually good shipping facilities. The plant is directly served by the Fairport, Painesville and Eastern railroad, which connects at Painesville, 2½ miles distant, with the New York Central, Baltimore & Ohio and the Nickle Plate. Because Fairport is located on Lake Erie, as well as trunk highways, it is possible for this new company to ship by rail, water, or highway.

Construction

The plant, in practically its entirety, was designed by the Fuller-Lehigh Co., Fullerton, Penn. Construction, including all the concrete work, silos and pack house, was done by the Spencer Construction Co. The main building, which houses the entire plant excepting the silos and pack house, is of structural steel on concrete foundations and is covered, sides and roof, with heavy corrugated steel. Its over-all dimensions are 134 x 528 ft. The silos and pack house are of concrete, and the 250-foot stack is of brick. Plans are drawn for a permanent office and laboratory, construction of which is to be started immediately; at present temporary quarters are being occupied.

Material Handling and Storage

Limestone is shipped to Fairport from Rogers City, Mich., in self-unloading freighters and is unloaded at the Diamond Alkali Co.'s docks, where it is put through that company's screening plant. That which is too small for use in the alkali plant is loaded into regular freight cars and hauled to the cement plant. Three tracks parallel the storage building and the one closest to it is provided with steel track hoppers, one each for stone and gypsum. A 36-in. pan conveyor moves the stone from the hopper directly to a Pennsylvania hammer crusher, powered by a 100-h.p. General Electric motor. The crusher discharges into a second



One of the 4-in. centrifugal slurry pumps

pan conveyor which in turn discharges into storage where it is rehandled by crane.

Gypsum is taken from the track hopper by a belt conveyor leading to an enclosed chain-bucket elevator which discharges into a 150-ton capacity concrete bin. These are the only elevators in the entire plant. A 10-ton Brownhoist overhead traveling electric crane, equipped with a 4½-yd. clamshell bucket, handles all the materials, into and out of storage, including the clinker. The storage is 80 ft. wide and 440 ft. long.

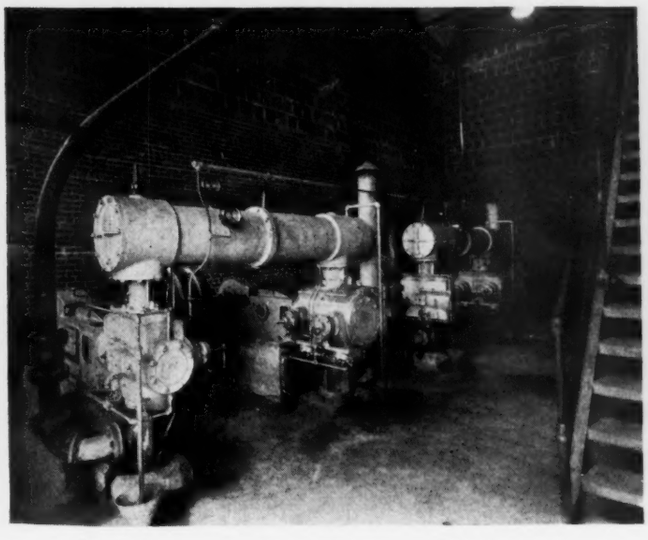
Clay is brought to the plant from the company's own deposit in 20-yd. Western dump cars. At present the length of this haul is about 150 yds. The clay cars enter directly into the center of the storage building, from the open end, and dump on either side.

Plant Operating Details

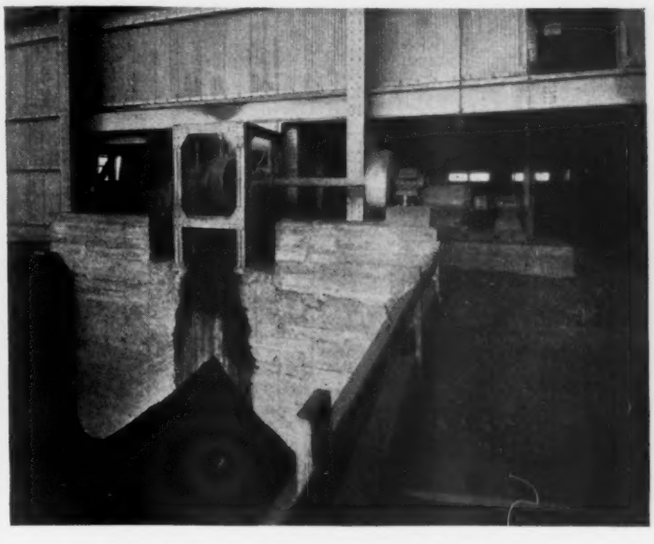
The crane places clay in a concrete bin, within the general storage building, where it is broken up by a 4-in. stream of water and carried by gravity through an inlet chute to a 24-fot. octagonal wash mill, the agitators of which are driven through leather belt drive by a 40-h.p. Westinghouse motor. From the wash mill the clay slurry moves by gravity to two concrete slurry basins 20 ft. in diameter by 15 ft. deep. These have double agitators, each set of which is driven by a 10-h.p. motor through a W. A. Jones Foundry and Machine Co. speed reducer, of 22 to 1 r.p.m. ratio. Two steel tanks, equipped with agitators, are being installed between the wash mill and concrete basins for storage of surplus slurry. In all the slurry tanks and basins, compressed air agitation is provided in addition to the mechanical agitators, to insure thorough agitation.

From the slurry basins the slurry is pumped to the wet mills by two 4-in. Morris centrifugal pumps, vertically driven by 25-h.p. G.-E. motors. Overflow returns to the basins through a 6-in. line. The wet mills are the usual three-compartment type, furnished by the Traylor Engineering and Manufacturing Co., and are driven by 500-h.p. super-synchronous G.-E. motors. A Schaffer poidometer serves each mill. Here again Morris pumps pick up the slurry and send it to the correcting basins. There are six of these, 25 ft. high and 20 ft. in diameter, of steel construction. They are installed in two batteries of three tanks each and each battery's agitators are powered by a 25-h.p. G.-E. motor through Jones speed reducer of 22.28 to 1 ratio. All of the agitator equipment was furnished by the F. L. Smidt Co.

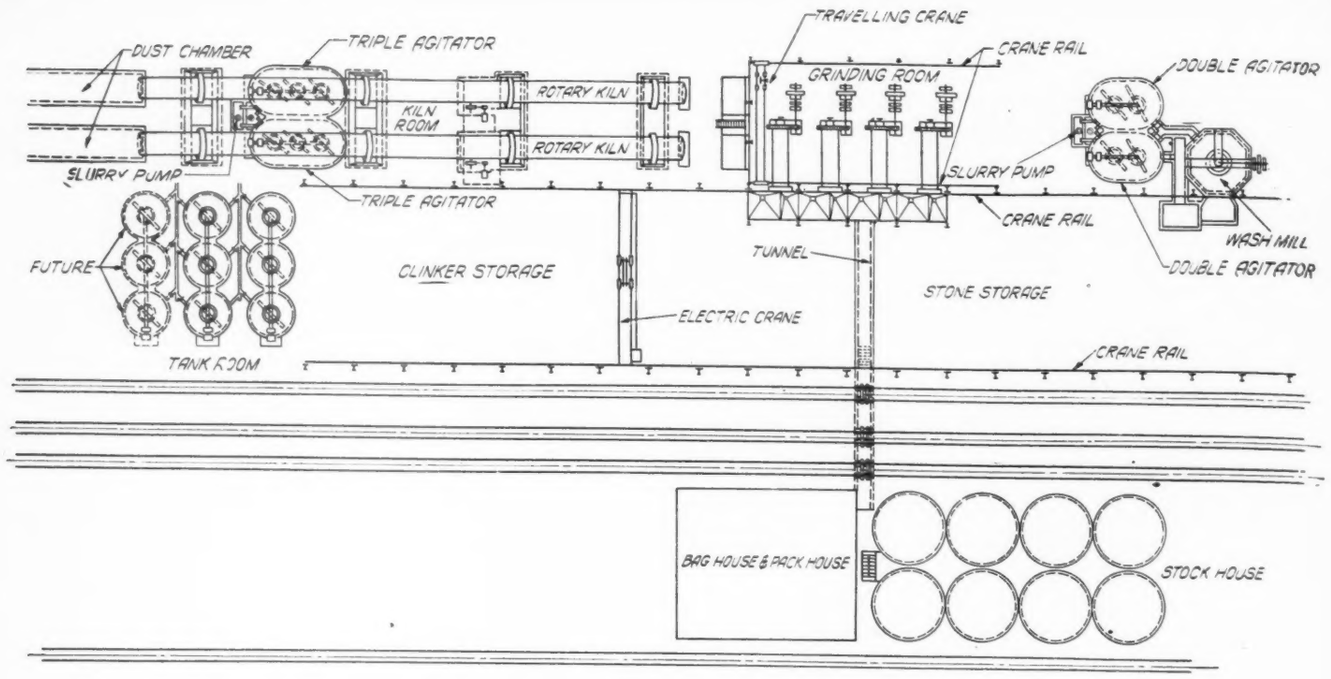
Leaving the correction tanks, the slurry flows by gravity to two 1100-bbl. capacity kiln basins. These are rectangular with rounded corners and are of reinforced con-



Pair of air compressors driven by 100-h.p. synchronous motors



Clinker pit and driving mechanism on drag chain conveyor



General plan of the new Standard Portland Cement Co. plant

crete. Both are provided with triple agitators, each set of which is powered by a 15-h.p. G.-E. motor through a Jones speed reducer of 22 to 1 r.p.m. ratio. Four-inch Morris centrifugal pumps handle the slurry from the kiln basins directly to the Ferris-wheel feeders on the two kilns.

The kilns, manufactured by the Vulcan Iron Works, are 10 x 240 ft., each driven by a 75-h.p. G.-E. motor through Link-Belt silent-chain drive. They are equipped with dust chambers designed by the cement company engineers, which are of the conventional baffle-type. Four spiral conveyors handle the reclaimed dust, discharging it into a larger conveyor which empties to a Fuller-Kinyon pump, the discharge of which leads to the kiln feeders. The conveyors are driven from a common shaft powered by a 10-h.p. G.-E. motor through an "Industrial Type" gear speed reducer made by the Hill Clutch Machine and Foundry Co. The kiln dampers are controlled from the firing end by means of J. H. Channon Manufacturing Co. winches.

Powdered coal from the alkali plant is blown through an underground line into two 40-ton capacity steel hopper bottom bins. It is fed through automatic feeders and blown into each kiln by a No. 9 "Sirocco" blower driven by a 50-h.p. Westinghouse motor. Compressed air for agitation, conveying and general purposes around the plant, is supplied by two 14 x 8 x 10-in. Bury compressors driven by 100-h.p. G.-E. synchronous motors. The two exciter sets for these are of 100 h.p. each.

Clinker discharges into a drag conveyor emptying into a 900-bbl. capacity concrete-lined pit within the storage building, from which it is removed by the crane to larger storage space. The drag chain conveyor is driven by a 15-h.p. G.-E. motor through a Jones reducer of 51.75 to 1 r.p.m. ratio.

The finish grinding mills are the same size and type as the wet mills. A row of four steel bins within the general storage building is fed by the crane with stone and clinker and these bins serve their respective mills, through Schaffer poidometers.

Silos and Pack House

The concrete tunnel connecting the grinding plant and the silos extends from the center of the former's inside wall, straight to the packhouse end of the silos, thereby eliminating all unnecessary conveying. There are eight silos, each 32 ft. in diameter by 60 ft. in height. With their ten interspaces they have a total capacity of 150,000 bbl. The silos are arranged in two rows and under them run four sets of tracks for the new Fuller-Kinyon conveying systems. Spouts from the silos are closely spaced and are in perfect alignment with a hopper connection on the Fuller-Kinyon "cars." The pipe line in which the cement is pumped to the baggers, likewise have flexible connections under each hopper, in perfect alignment with the discharge of the pump. Each of the four pumps is powered by a 50-h.p. G.-E. motor.

The pack house has three floors. On the first are mounted the four three-spout Bates bag packers. As there is a loading track on either side of the building, the filled sacks are conveyed in both directions by two 30-in. Dick's conveyor belts mounted on Variety Iron and Steel Co. idlers and pulleys. The two conveyors are each driven by a 5-h.p. G.-E. motor through Jones reducers. The second floor is devoted to the cleaning, sorting, tying and storing of bags. The cleaner is of the revolving type, of large proportions, driven by a 15-h.p. G.-E. motor through Hill Clutch "Industrial Type" reducers and Link-Belt sprocket chain. Bags are elevated to the cleaning floor in a lift elevator and conveyed to the cleaning machine on a 36-in. belt conveyor mounted on Variety idlers and pulleys. The cleaner was furnished by the Nazareth Foundry Co., Nazareth, Penn. On the third floor are the W. W. Sly Co. dust arresters. This equipment, together with the dust chambers on the kilns, will make possible a practically dustless plant. The third floor also provides a portion of bag storage.

Personnel

The officers of the company are: T. R. Evans, president; W. A. Davis, vice-president; C. N. Windecker, vice-president; C. A. Follett, secretary, and A. H. Ingley, treasurer. E. J. Ochs is superintendent and Louis Creveling, chief chemist. Messrs. Davis and Ingley are the only officers of the company who will take an active part in the management. The general offices of the company are at 1741 Union Trust building, Cleveland, Ohio.

Sand Plant in Oxford District Digging Reservoir

THE sand plant of the J. C. Stewart Co. at Oxford, Mich., which began operations last July, is now digging a reservoir about 120 ft. square to furnish water for washing. The bottom of the reservoir will be carried below the ground water level of the district so that it will be self-filling. C. G. Knoblauch is superintendent. He was formerly with H. D. Conkey and Co. at their Mendota, Ill., plant. The J. C. Stewart Co. has a plant at Owasso, Minn., where it has its main offices.

Record Portland Cement Output in July

Shipments for the Month Total 18,131,000 Barrels

PRODUCTION and shipments of portland cement reached new high levels during the month of July, according to statistics compiled by the Bureau of Mines, Department of Commerce. Production shows an increase of more than 11%, and shipments more than 9%, over July, 1924. Stocks of portland cement decreased considerably, but are nearly 13% higher than in July, 1924. The output of three new plants, located respectively in Georgia, Michigan and Ohio is included for the first time in the statistics. The following tables, prepared by the Division of Mineral Resources and Statistics of the Bureau of Mines, are based mainly on the reports of producers of portland cement. The July, 1925, totals include estimates for one plant. Up to the issuing of this report the record for a month's production was made in May, 1925.

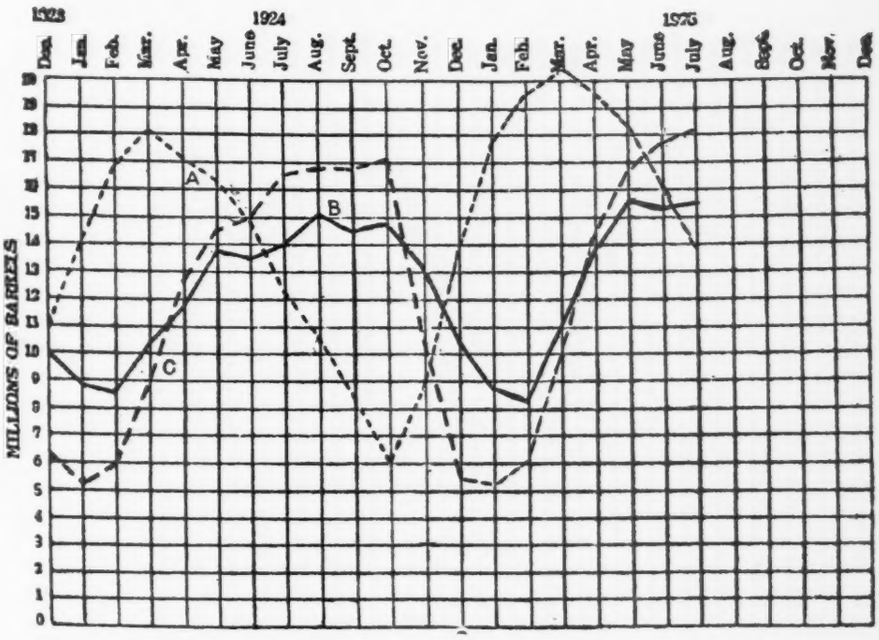
Total production for the month amounted to 15,641,000 bbl. as compared with 15,387,000 bbl. in June and 14,029,000 bbl. in July, 1924. Shipments totalled 18,131,000 bbl. as compared with 17,501,000 bbl. in June and 16,614,000 bbl. in July, 1924.

Clinker Stocks

Stocks of clinker, or unground cement, at the mills at the end of July, 1925, amounted to about 6,967,000 bbl. compared with 7,937,000 bbl. (revised) at the beginning of the month.

Distribution of Cement

The following figures show shipments from portland cement mills distributed among the states to which cement was shipped during May and June, 1924 and 1925:


1923
1924
1925
Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
MILLIONS OF BARRELS
A
B
C

(A) Stocks of finished portland cement at factories; (B) Production of finished portland cement; (C) Shipments of finished portland cement from factories

IMPORTS AND EXPORTS OF HYDRAULIC CEMENT, BY MONTHS, IN 1924 AND 1925

Month.	IMPORTS 1924 Barrels	IMPORTS 1924 Value	IMPORTS 1925 Barrels	IMPORTS 1925 Value	EXPORTS 1924 Barrels	EXPORTS 1924 Value	EXPORTS 1925 Barrels	EXPORTS 1925 Value
January	153,839	$250,799	229,838	$361,098	88,586	$252,497	71,596	$207,547
February	162,930	219,588	119,077	206,308	62,606	194,110	56,249	181,356
March	160,517	254,745	218,054	374,839	91,224	254,687	65,248	200,410
April	148,137	227,300	197,686	280,826	83,200	229,183	89,508	263,831
May	161,304	232,950	186,897	286,959	88,850	262,290	85,385	250,845
June	196,655	283,112	254,937	409,539	74,064	229,852	71,343	217,899
July	108,944	181,111	†	†	60,139	186,073	†	†
August	192,634	305,690	.....	.....	85,883	251,904	.....	.....
September	138,369	232,991	.....	.....	69,470	206,921	.....	.....
October	214,987	337,199	.....	.....	79,180	253,479	.....	.....
November	198,806	305,598	.....	.....	42,490	130,519	.....	.....
December	173,814	285,481	.....	.....	52,851	163,639	.....	.....
	2,010,936	$3,116,564	.....	.....	878,543	2,615,154	.....	.....

†Imports and exports in July, 1925, not available.

PORTLAND CEMENT SHIPPED FROM MILLS INTO STATES, IN MAY AND JUNE, 1924 AND 1925, IN BARRELS*.

Shipped	May 1924	May 1925	June 1924	June 1925
Alabama	129,432	185,314	115,416	214,195
Alaska	637	.....	132	1,284
Arizona	33,469	32,749	31,126	32,451
Arkansas	75,258	87,340	89,507	92,101
California	1,044,824	1,081,945	954,751	1,066,088
Colorado	141,894	125,744	140,995	120,818
Connecticut	166,717	177,292	181,858	172,564
Delaware	42,874	28,892	34,413	37,330
District of Columbia	51,807	103,996	60,307	81,334
Florida	170,110	313,846	148,144	348,330
Georgia	117,426	127,545	113,412	129,748
Hawaii	1,979	5,608	944	6,108
Idaho	28,199	28,613	20,583	28,122
Illinois	1,421,534	1,790,601	1,311,151	1,636,329
Indiana	523,774	569,436	556,814	617,360
Iowa	421,523	346,484	393,866	310,558
Kansas	247,164	242,880	194,394	233,522
Kentucky	145,624	195,351	157,555	231,491
Louisiana	106,977	99,402	100,299	100,016
Maine	45,512	38,435	49,013	43,541
Maryland	157,933	231,935	192,865	249,105
Massachusetts	364,354	374,243	372,620	350,620
Michigan	989,217	1,140,027	1,133,346	1,264,462
Minnesota	404,999	425,473	451,614	409,235
Mississippi	48,772	47,573	38,886	66,012
Missouri	391,946	652,330	290,852	583,561
Montana	28,421	28,170	22,106	28,904
Nebraska	154,977	198,333	132,394	181,516
Nevada	8,480	11,676	11,463	10,784
New Hampshire	37,609	36,814	39,026	40,837
New Jersey	593,922	721,605	682,058	737,572
New Mexico	37,588	17,141	27,893	18,406
New York	1,710,784	2,028,808	1,986,985	2,090,644
North Carolina	319,454	289,056	278,936	324,201
North Dakota	29,414	47,789	45,337	66,089
Ohio	863,045	1,054,230	958,245	1,099,767
Oklahoma	264,611	235,096	189,119	225,879
Oregon	113,812	129,048	122,893	134,038
Pennsylvania	1,093,389	1,482,560	1,298,303	1,869,299
Porto Rico	.....	.....	5,186	.....
Rhode Island	73,437	72,914	73,286	89,213
South Carolina	51,285	74,198	47,118	85,087
South Dakota	49,995	66,445	54,540	59,120
Tennessee	155,684	163,812	129,124	185,536
Texas	359,570	373,605	344,403	411,795
Utah	62,439	41,447	53,956	37,733
Vermont	28,991	24,178	72,169	26,978
Virginia	156,109	154,167	118,672	172,760
Washington	192,570	265,735	275,028	328,589
West Virginia	149,396	140,992	215,505	161,484
Wisconsin	474,104	507,654	524,846	569,687
Wyoming	40,153	32,466	46,734	31,290
Unspecified	139,036	8,023	67,442	3,996
	14,462,230	16,659,016	14,957,540	17,417,489
Foreign countries	88,770	75,984	78,460	83,511
Total shipped from cement plants	14,551,000	16,735,000	15,036,000	17,501,000

*Includes estimated distribution of shipments from three plants for May and June, 1924, and from four plants for May and June, 1925.

*IMPORTS AND EXPORTS

Exports of hydraulic cement by countries, in June, 1925.

Exported to—	Barrels	Value
Canada	2,439	$8,539
Cuba	17,816	42,215
Other West Indies	1,412	4,117
Mexico	10,400	29,421
Central America	3,854	11,663
South America	31,409	97,851
Other countries	4,013	24,093
	71,343	217,899

Domestic hydraulic cement shipped to Alaska, Hawaii and Porto Rico in June, 1925.

	Barrels	Value
Alaska	2,262	$6,315
Hawaii	11,483	27,107
Porto Rico	3,440	7,973
	17,185	41,395

*Compiled from records of the Bureau of Foreign and Domestic Commerce and subject to revision.

PRODUCTION, SHIPMENTS AND STOCKS OF FINISHED PORTLAND CEMENT, BY MONTHS, IN 1924 AND 1925, IN BARRELS

Month	Production		Shipments		Stocks at end of months	
	1924	1925	1924	1925	1924	1925
January	8,788,000	8,856,000	5,210,000	5,162,000	14,155,000	17,656,000
February	8,588,000	8,255,000	5,933,000	6,015,000	16,815,000	19,689,000
March	10,370,000	11,034,000	8,995,000	10,279,000	18,189,000	20,469,000
First Quarter	27,746,000	28,145,000	20,138,000	21,456,000	.....	.....
April	11,726,000	13,807,000	12,771,000	14,394,000	17,159,000	19,877,000
May	13,777,000	15,503,000	14,551,000	16,735,000	16,403,000	18,440,000
June	13,538,000	15,387,000	15,036,000	17,501,000	14,903,000	*16,409,000
Second Quarter	39,041,000	44,697,000	42,358,000	48,630,000	.....	.....
July	14,029,000	15,641,000	16,614,000	18,131,000	12,319,000	13,920,000
August	15,128,000	.....	16,855,000	.....	10,666,000	.....
September	14,519,000	.....	16,827,000	.....	8,404,000	.....
Third Quarter	43,676,000	.....	50,296,000	.....	.....	.....
October	14,820,000	.....	17,160,000	.....	6,073,000	.....
November	13,141,000	.....	10,289,000	.....	8,928,000	.....
December	10,435,000	.....	5,506,000	.....	13,913,000	.....
Fourth Quarter	38,396,000	.....	32,955,000	.....	.....	.....
	148,859,000	.....	145,747,000	.....	.....	.....

*Revised.

PRODUCTION, SHIPMENTS AND STOCKS OF FINISHED PORTLAND CEMENT, BY DISTRICTS IN JULY, 1924 AND 1925, AND STOCKS IN JUNE, 1925, IN BARRELS.

Commercial District	Production—July		Shipments—July		Stocks at end of July		Stocks at end of June, 1925*
	1924	1925	1924	1925	1924	1925	
E'n Pa., N. J. & Md.	3,418,000	3,703,000	4,205,000	4,564,000	2,734,000	2,460,000	3,321,000
New York	718,000	838,000	962,000	1,045,000	784,000	778,000	985,000
Ohio, W'n Pa. & W. Va.	1,503,000	1,618,000	1,955,000	1,754,000	1,193,000	1,599,000	1,735,000
Michigan	1,058,000	1,223,000	1,100,000	1,322,000	528,000	967,000	1,065,000
†Wis., Ill. Ind. & Ky.	2,166,000	2,249,000	2,570,000	2,743,000	1,950,000	2,611,000	3,106,000
Va., Tenn., Ala. & Ga.	962,000	1,230,000	1,109,000	1,375,000	606,000	264,000	410,000
E'n Mo., Ia., Minn. & S. D.‡	1,333,000	1,444,000	1,633,000	1,846,000	2,110,000	2,406,000	2,808,000
W'n Mo., Neb. Kans. & Okla.	935,000	1,110,000	993,000	1,187,000	1,137,000	1,539,000	1,615,000
Texas	409,000	454,000	442,000	463,000	264,000	232,000	241,000
Colo. & Utah	273,000	246,000	293,000	208,000	167,000	381,000	343,000
California	986,000	1,122,000	1,025,000	1,139,000	326,000	435,000	451,000
Ore. Wash. & Mont.	268,000	404,000	327,000	485,000	520,000	248,000	329,000
	14,029,000	15,641,000	16,614,000	18,131,000	12,319,000	13,920,000	16,409,000

*Revised. †Began producing June, 1924. ‡Began producing December, 1924, and shipping January, 1925.

*IMPORTS AND EXPORTS

Imports of hydraulic cement by countries and by districts, in June, 1925.

Imported from—	District into which imported.	Barrels	Value
Belgium	Massachusetts	18,021	$35,175
	New York	608	1,200
	South Carolina	4,259	5,665
	Florida	65,584	99,859
	New Orleans	5,963	9,292
	Los Angeles	46,093	82,869
	San Francisco	143	177
	Oregon	13,309	17,176
	Washington	11,462	20,292
	Total	165,712	271,705
Canada	Maine and New Hampshire	500	1,407
	Vermont	5,082	7,594
	Saint Lawrence	3,295	5,196
	Rochester	3,479	4,373
	Buffalo	6,750	11,416
	Total	19,106	$29,986
Denmark	Porto Rico	8,442	$12,523
France	New York	.....	32
Germany	New Orleans	840	$816
Norway	Maine and New Hampshire	4,039	$4,380
	Massachusetts	12,028	19,200
	San Francisco	2,991	4,928
	Washington	16,996	27,130
	Hawaii	24,533	38,223
	Total	60,587	$93,861
United Kingdom	Los Angeles	202	$554
	Porto Rico	48	62
	Total	250	$616
	Grand total	254,937	$409,539

*Compiled from records of the Bureau of Foreign and Domestic Commerce and subject to revision.

French Production of Bauxite

(Vice Consul Alfred D. Cameron, Paris)

THE annual production of bauxite in France has been running well above 300,000 metric tons, attaining 340,000 in the calendar year 1924. Exports amounted to 167,081 tons in 1922, 192,508 in 1923 and 202,534 in 1924. During the first months of 1925 exportation was less than during the same period of 1924, the January and February total being less than two-thirds of that for those months in the preceding year. This is not peculiar to bauxite, however, a similar or more marked decrease occurring in the exportation of all other nonferrous metals.

The principal countries of destination for the exported bauxite are Switzerland (for the great factories at Neuhausen) and Great Britain (largely for the British Aluminum Co. in Scotland). Germany, Norway, Italy and the United States take smaller amounts, in approximately the order named.

It is estimated that nine-tenths of the French bauxite produced in 1921 was used to make aluminum. Since then a new element has entered into the industry—the quick-setting hydraulic cement known as "ciment fondu," in which large quantities of bauxite are used.

There has been some question during the past year of prohibiting the exportation of bauxite from France. The rumors to this effect, however, have not been confirmed and it is not now expected that such an action will be taken by the government. It is true, however, that the French aluminum factories are expanding their productive capacity and, unless there is a considerable increase in bauxite production, prices of red bauxite suitable for refining may increase.

The deposits of red bauxite are concentrated principally in the Departments of Var and Bouches du Rhone. The ore is shipped in cargo lots from St. Raphael (Var) and Port de Bouc (Bouches du Rhone).—*U. S. Commerce Report.*

Magnesium Carbonate and Magnesia from Dolomite

A PATENT (U. S. No. 1,542,684, June 16, 1925) has been issued for the recovery of pure magnesium carbonate from dolomite. The method consists essentially of the calcination of dolomite and then slacking the oxides obtained. Acetic acid is then added to neutralize the lime and the unsoluble calcium acetate filtered off. The filtrate is then treated with carbonic acid in which only the magnesium carbonate is soluble. Consequent evaporation and calcination yields magnesia. The reactions are:

$CaCO_3 . MgCO_3 \rightarrow MgO . CaO + CO_2$

$MgO . CaO + 2H_2O \rightarrow Mg(OH)_2 . Ca(OH)_2$

$Mg(OH)_2 . Ca(OH)_2 + 4CH_3COOH = Mg(COOCH_3)_2 + Ca(COOCH_3)_2 + 2H_2O$

$Mg(COOCH_3)_2 + H_2CO_3 \rightarrow MgCO_3 + 2CH_3COOH.$

Factors Affecting the Time of Set of Mechanically Mixed Gypsum Mortars*

Results of Investigations of the United States Bureau of Standards Show It Is Set Gypsum in the Mixer That Causes Difficulty

By L. E. Smith

IN CONSTRUCTION WORK mechanical mixers are seldom used with any degree of success in the preparation of gypsum mortars as it has been found that in most cases the time of set of the mortars is accelerated to such an extent that by the time the mortar is brought to the plasterer it has already begun to set. The work herein reported was undertaken with the object of determining the cause of the acceleration in the time of set of gypsum mortars often occurring when the mortars are made in mechanical mixers. The same problem is met with in the mechanical mixers used in connection with gypsum-tile machines.

Householder[1] found that, using unretarded neat gypsum, the rate and time of stirring had quite an appreciable effect on the time of set of the mortar. In his work in which the stirring was done by hand by means of a spatula a marked acceleration of the time of set was found.

For the present work a revolving, drum type, mechanical mixer was designed, 12 in. in diameter and 6 in. in length. Originally upon the interior surface of the mixer there were fitted four angular blades but these were removed as it was found that more efficient mixing could be obtained when the interior surface of the drum was smooth. The driving shaft of the mixer was belted to a work and worm wheel which was driven by an electric motor. By means of the pulleys various speeds of revolution of the mixer could be obtained. Figure 3 is an illustration of the apparatus used.

Calcined gypsum was obtained from three representative localities and in each case a plastering sand, which was used commercially with that particular brand of gypsum, was also obtained. Using a 1:2 gypsum-sand mix the dry materials were placed in the machine and allowed to mix thoroughly. Enough commercial retarder was added to prevent too rapid a set of the mortars. A part of the dry mix was removed and mixed with enough water to give a mortar of a consistency of a 1-in. slump in a 2x4-in. cylinder. While this consistency is wetter than is usually recommended it was found that such a consistency was best suited for efficient mixing in the machine. Then to the dry mix in the machine the same percentage of water as used in the trial mix was added and the mixer allowed to run for 5-, 10-, 15-, and 20-min. periods. After each run a representative portion of the mortar was tested for time of set by the Vicat needle. Before each run the mixer was thoroughly cleaned. Only one rate of stirring, 12 r.p.m., was used. The experimental results are given in Table 1. It can be seen from this table that in no case was there any appreciable acceleration of the time of set of the mortars that could be attributed to the effect of stirring.

The next step in the work was to determine the effect of set gypsum ($CaSO_4 2H_2O$), on the time of set of the mortars. This was accomplished by allowing a small amount of the mortar from the previous run to set in the mixer. With this exception the procedure used was the same as previously described. The results are given in Table 2. It is evident that the presence of set gypsum accelerates the time of set of gypsum mortars to a marked degree, but here again the time of stirring had no appreciable effect on the time of set of the mortars.

In order to determine more or less quanti-

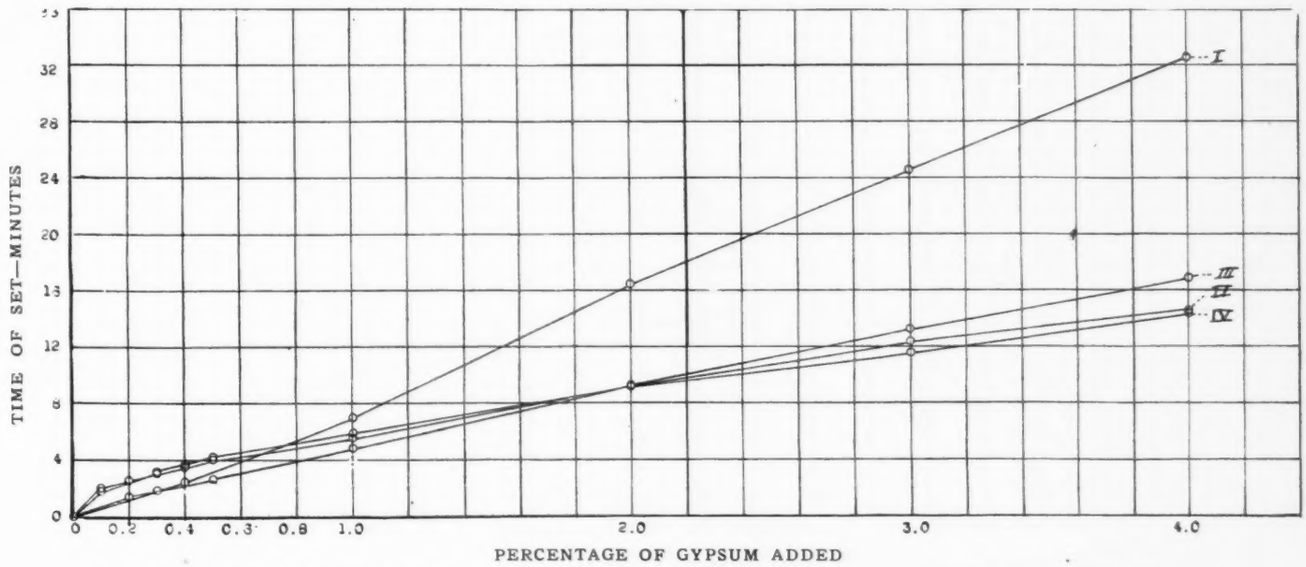


Fig. 1. Variation in the time of set of gypsum due to the addition of varying amounts of set gypsum

*Published by permission of the director of the National Bureau of Standards of the United States Department of Commerce.

[1] Householder, F. F., "Some Factors Influencing the Time of Set of Calcined Gypsum," Jour. Am. Cer. Soc., Vol. I, p. 578.

tatively the effect of set gypsum ($CaSO_4 2H_2O$) on the time of set of gypsum mortars, mixes were made using four different brands of hair-fibred gypsum plasters. In each case a 1:2 gypsum-sand mix was made using a sand ordinarily employed commercially with each brand of gypsum. The percentages of set gypsum added, based on the weight of calcined gypsum, were 0.1, 0.2, 0.3, 0.4, 0.5, 1.0, 2.0, 3.0, and 4.0%. The mortars were made of such a consistency as to give a ½-in. slump in a 2x4-in. cylinder. The results are given in Table 3.

In all the tables the percentage of water, the unaccelerated mix. These quotients then represent the relative rates of set of the mortars when accelerated with varying percentages of set gypsum.

From a study of Fig. 2 it is noted that each accelerated mix to the time of set of approximately directly proportional to the amount of set gypsum added. The slope of I is much steeper than that of II, III and IV.

Conclusions

1. The time of stirring of retarded gypsum mortars has no appreciable effect on their time of set.

2. The addition of set gypsum ($CaSO_4 2H_2O$) accelerates the time of set of retarded gypsum mortars.

3. When set gypsum is added the relative rate of set of retarded gypsum mortars is approximately directly proportional to the amount of set gypsum added.

From the results of these studies it would seem that the difficulties of using mechanical mixers in the preparation of gypsum mortars in practice is not due to any effect that could be attributed to the mixer directly. The presence of set gypsum in the mix is probably the cause of the acceleration in the time of set of the mortars.

The problem then is to keep the set gypsum out of the mix. It is believed this would be accomplished by the use of a plaster sufficiently retarded so that the time of set of the mortars would be longer than the working day. Then if the machine were thoroughly cleaned at the close of every day there would not be any contamination of the new batches by set gypsum. In substantiation of this one construction job was visited where the above conditions existed. The mixer had been in use for several weeks with very good results.

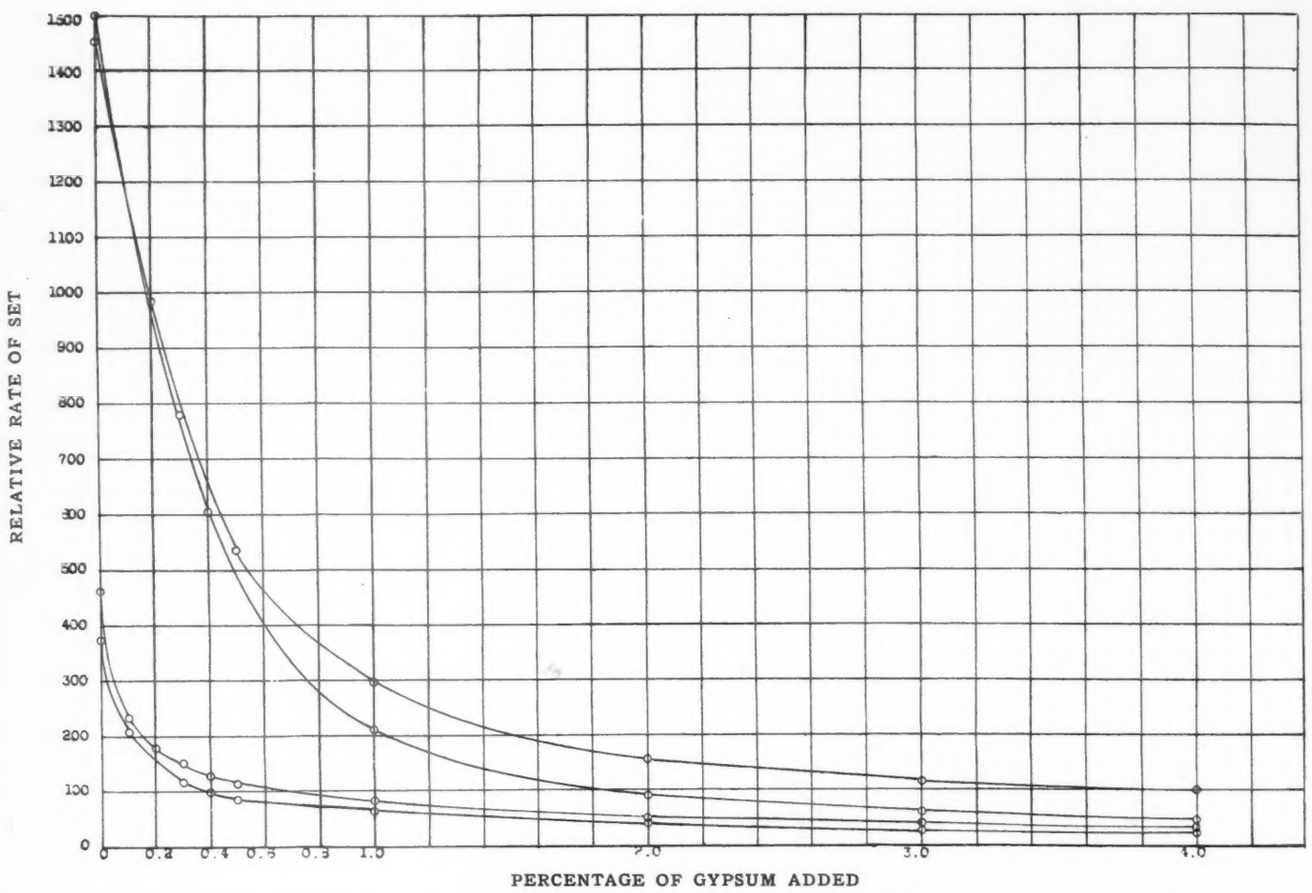


Fig. 2. Curve showing the relative rate of set of gypsum mortars due to the addition of varying amounts of set gypsum

the relative rate of set of the mortars is based on the total weight of the materials used, is calculated from the weight of water necessary to make the mortars of the consistency used in that particular part of the work. In Fig. 1, the time of set of the mortars is plotted against the percentage of set gypsum added to the mortars. In Fig. 2, relative rate of set of the mortars is plotted against the percentages of set gypsum added to the mortars. The relative rate of set is calculated as the ratio of the time of set of

Table 2—Showing the Effect of the Presence of Set Gypsum on the Time of Set of Gypsum Mortars

Mix No.	% H_2O	Time of Mixing, Minutes	Time of Set, Minutes	Remarks
4	20		123	Mixed by hand 30 sec. No set gypsum added.
	20	5	46	About 0.4% set gypsum in mix.
	20	10	44	About 0.4% set gypsum in mix.
	20	15	46	About 0.4% set gypsum in mix.
	20	20	45	About 0.4% set gypsum in mix.
5	20		79	Mixed by hand 30 sec. No set gypsum added.
	20	5	38	About 0.2% set gypsum in mix.
	20	10	37	About 0.2% set gypsum in mix.
	20	15	38	About 0.2% set gypsum in mix.
	20	20	38	About 0.2% set gypsum in mix.
6	21		160	Mixed by hand 30 sec. No set gypsum added.
	21	5	31	About 0.1% set gypsum in mix.
	21	10	29	About 0.1% set gypsum in mix.
	21	15	30	About 0.1% set gypsum in mix.
	21	20	28	About 0.1% set gypsum in mix.

Table 1—Showing the Effect of Stirring on the Time of Set of Gypsum Plasters

Mix No.	% H_2O	Time of Mixing, Minutes	Time of Set, Minutes	Remarks
1	21		142	Mixed by hand 30 sec.
	21	5	141	
	21	10	140	
	21	15	138	
	21	20	135	
2	20		79	Mixed by hand 30 sec.
	20	5	79	
	20	10	78	
	20	15	78	
	20	20	77	
3	20		123	Mixed by hand 30 sec.
	20	5	119	
	20	10	121	
	20	15	123	
	20	20	116	

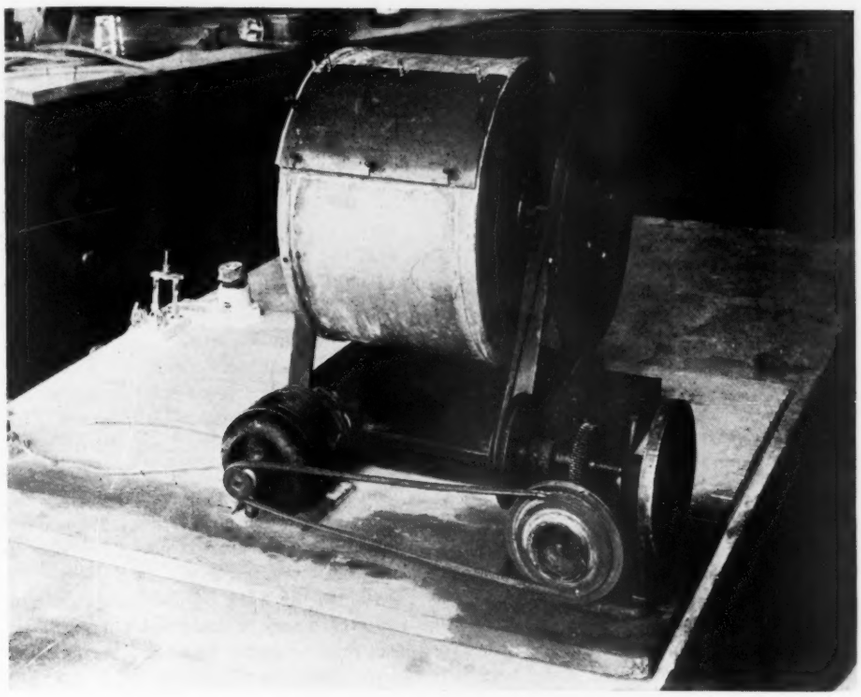


Fig. 3. Laboratory mechanical gypsum plaster mixer

Table 3—Showing the Percentage Acceleration of the Time of Set of Gypsum Plasters with the Addition of Various Amounts of Set Gypsum

Mix No.	% H_2O	Time of Set, Minutes	Relative Rate of Set	% Set Gypsum Added
1	20	46	32.6	4.0
		61	24.6	3.0
		91	16.5	2.0
		210	7.1	1.0
		604	2.5	0.4
		780	1.9	0.3
		1500		0.0
2	18.9	100	14.6	4.0
		117	12.4	3.0
		158	9.2	2.0
		297	4.9	1.0
		536	2.7	0.5
		987	1.5	0.2
		1455		0.0
3	16.7	22	16.9	4.0
		28	13.3	3.0
		40	9.3	2.0
		62	6.0	1.0
		86	4.3	0.5
		99	3.8	0.4
		116	3.2	0.3
		207	1.8	0.1
		372		0.0
4	17.9	32	14.4	4.0
		40	11.6	3.0
		50	9.2	2.0
		83	5.6	1.0
		112	4.1	0.5
		127	3.6	0.4
		150	3.1	0.3
		177	2.6	0.2
		232	2.0	0.1
		462		0.0

A Newspaper Quarry Blast!

E. J. KRAUSE, president of the Columbia Quarry Co., St. Louis, Mo., calls our attention to a ridiculous newspaper story about a recent blast at one of his quarries.

Unfortunately we are guilty of repeating some of what should have been obvious errors in a news note on p. 73 of ROCK PRODUCTS, August 8. (You see, these errors in news notes come from our "cub editor"; for every editorial office has a new editor just breaking in, just as every printing office has a "printers' devil," to whom all errors are attributable!)

The news item referred to gave the Columbia Quarry Co. the enviable (?) record of shooting down 150,000 tons of rock for $68,000! This would be about 22 cents a ton.

Mr. Krause says the facts are these: "A moving picture man for some film agency went down to make a picture of the shot. A St. Louis *Globe Democrat* photographer also went down. I was assured that neither one were reporters. The *Globe Democrat* man made 22 pictures of the plant and the shot. He asked me for some captions, as he wanted to put some pictures in the rotogravure section. I gave him one caption covering the 235,000 tons of stone shot down in the quarry that it has taken us four months to prepare. I carefully explained that the cost covered stripping 14 ft. of dirt, together with interest and maintenance on the shovel and cars, the cost of drilling, and interest, maintenance and power for the drill, the hand stripping, the loading of the shot, the dynamite fuse, caps, the jigger drilling and secondary shooting, and I gave the cost of all this together with overhead at $40,000, which I believe to be below what it can be done for. My last word of caution was to say that it would be particularly unfortunate if there was any mixup and the wrong caption was used with the wrong picture.

"I left for Canada immediately. I was more than surprised to find that every St. Louis paper carried an article, sensational in its nature, saying that we shot 150,000 tons of earth high in the air and the surrounding towns trembled, while there was no noticeable tremor at the point of the shot. This article, I find, was copied in a dozen other papers in the country.

"The net result of this article was to get about one-half a page of the St. Louis *Globe Democrat* Sunday rotogravure section, with a picture of the shot at the moment the explosion took place, and it gave full credit to the Columbia Quarry Co. and has resulted in a great deal of publicity with only a very minor amount of amused comment from a very few people who know better than to believe the figures used."

The explanation is interesting and instructive. Experienced publicists long ago learned that any statement involving figures, or where accuracy was an important consideration, should not be trusted to a verbal explanation to any newspaper reporter. They have a proverbial talent for getting them mixed. A little type-written statement handed a newspaper reporter is not only much appreciated by him but is pretty fair insurance that his figures and facts will not be garbled.

We are glad to rectify our part in propagating the error and to give the real facts in so much detail.

Limestone vs. Gypsum as Egg-Shell Builder

TO THE EDITOR: You have ended an article on poultry grit in ROCK PRODUCTS, June 27, 1925, p. 44, with an editor's note featuring the Centerville Gypsum Co., Centerville, Ia., saying also: "Gypsum is equally or even more efficient than limestone as a source of calcium for eggshells."

Gypsum contains calcium sulphate which is carried in an acid base while calcium carbonate (limestone) is carried in an alkali base. The reaction is absolutely different in its effects upon the hydrochloric acid, which is the active agent in the whole digestive tract. Therefore, it is absolutely impossible to substitute one for the other, as they are diametrically opposed in their action. Gypsum cannot be substituted for limestone as a body or shell-builder or egg-producer.

M. F. HALL,
President, Ohio Marble Co.,
Piqua, O.

United States Court Decision in Gypsum Wall-Board Patent Case

An Important Ruling on Validity of a Fundamental Manufacturing Process for a Wall-Board with Turned-in Edge

HEREWITH is the full text of the decision of the United States District Court for the northern district of Illinois, eastern division, in a history-making patent controversy between the United States Gypsum Co. and the Bestwall Manufacturing Co. et al. The decision was rendered by Judge James H. Wilkerson on July 21, 1925.

Decision

"The original bill in this case named Bestwall Manufacturing Co. as sole defendant. It charged infringement of letters patent No. 1,029,328 and No. 1,034,746. The first covers a method of manufacturing plaster board; the second covers the product. The case was tried by Judge Sanborn, who held all claims of both patents valid and infringed (258 Fed. 647). That decree was affirmed by the Circuit Court of Appeals (270 Fed. 542).

"In June, 1921, plaintiff filed a supplemental bill, bringing in new defendants and charging other infringements. An application for a preliminary injunction based upon the supplemental bill was denied by Judge Page sitting in the District Court. Plaintiff appealed and the order denying the injunction was affirmed by the Circuit Court of Appeals on April 8, 1923 (290 Fed. Rep. 800). In July, 1922, the Bestwall Manufacturing Co. applied to the Circuit Court of Appeals for leave to open the decree in the District Court for the purpose of introducing evidence to the effect that one Brown was really the inventor and that the patents are, therefore, invalid. The petition was denied on April 18, 1923 (290 Fed. 798).

"Motions were then made by the plaintiff to strike out certain portions of the answers of defendants and to limit the proofs at the trial. These motions were overruled on February 24, 1924, and the case made by the supplemental bill and the answer thereto was heard in open court, the trial ending on December 23, 1924. Briefs were then filed by the respective parties and the case is now submitted for decision.

"1. Defendants American Cement Plaster Co., the Beaver Board Cos. and the Beaver Products Co., Inc., are not barred by the order of the Circuit Court of Appeals in Bestwall Manufacturing Co. v. United States Gypsum Co. (290 Fed. 798) from asserting the defense of invalidity based upon the alleged prior invention of Brown. They were not parties to the original decree in this case and the evidence fails to establish a privity of relationship which makes the original decree herein and the order of the Circuit Court of Appeals binding upon them. The rules concerning "the law of the circuit" and "the law of the case" invoked by plaintiff must yield, of course, to the basic principle that a party is entitled to his day in court. The three new defendants have not had their day in court, either personally or by representation, upon any of the issues involved in this case, and they are entitled to the same kind of a hearing as if the supplemental bill were an original suit in which they were defendants.

"2. Plaintiff contends that under the rule stated in 290 Fed. 798 the defense of invalidity based on Brown's alleged invention must be overruled. Defendants assert that the opinion in that case, if given the interpretation for which plaintiff argues, contravenes Section 8 of Article 1 of the Constitution and Section 4886 R. S., as well as the opinion of the Supreme Court in *Thompson Spot Welder Co.* v. *Ford Motor Co.*, 265 U. S. 445 (decided June 2, 1924). Counsel for plaintiff have much to say about the "law of the case" and "the law of the circuit." *Luminous Unit Co.* v. *Freeman-Sweet Co.*, 3 F. (2nd) 577, states the limitations upon those doctrines. Defendants American Cement Plaster Co. ,the Beaver Board Cos. and the Beaver Products Co., Inc., have the right, in my opinion, to show prior invention by Brown as a basis for the claim of invalidity. The statute confers no power upon an employer to declare that one of his employes is an inventor, when, in fact, the employee has made no invention. A patent which is not supported by the oath of the inventor, but is applied for by one who is not the inventor, is unauthorized by law and void, and whether taken out in the name of the applicant or of any assignee of his, confers no rights as against the public. (*Kennedy* v. *Hazelton*, 128 U. S. 668.)

"3. A process may be patentable irrespective of the particular form of the instrumentalities used (*Cochrane* v. *Deener*, 94 U. S. 760; *Carnegie* v. *Cambria*, 185 U. S. 403). But in a process patent, as in all patents, the teaching of the specifications and the disclosure by the patentee must be such that after the patent has expired a user thereof shall not be left to the blind groping of experimental work, but by the plain teaching of the specification be enabled to use the process with certainty. Concept, alone, is not patentable (*Symington Co.* v. *National Malleable Castings Co. et al.*, 250 U. S. 383, 386). Though claims for a new product which has definite characteristics by which it may be identified and which distinguish it from the process by which it is made are not limited to the product as made under the disclosed process, nevertheless, product claims are not sustainable unless the specification discloses at least one practicable way in which to make the product (*Hemming Mfg. Co.* v. *Cutler-Hammer Mfg. Co.*, 243 Fed. 594, 600).

"The so-called demonstration made by Brown at the Grand Rapids plant and the disclosures in his application for a patent, in my opinion, did not advance the art a single step. His ideas were inchoate, nebulous and indeterminate. They do not furnish sufficient basis for assailing the validity or narrowing the scope of the patents relied upon by plaintiff. These patents should be interpreted and applied precisely as if the defense based upon the acts of Brown had not been brought into the case.

"4. In this view of the Brown defense it is not necessary to decide certain questions of fact relating to the acts of Utzmann. Upon those questions of fact plaintiff is at a decided disadvantage on account of the testimony of this witness. Utzmann, by his affidavit making and his testimony at the trial, has created a situation in which it is possible to accept his testimony only when corroborated by other credible evidence. But giving to the Brown defense all that is claimed for it on the facts, it is not sufficient, in my opinion, either to affect the validity of plaintiff's patents or to narrow their scope.

"5. We come then to what, in my opinion, is the real question in this case. Is plaintiff to be held strictly to the terms of its patents and to be limited to the specific process and product described and claimed therein? Or is it to be given the benefit of a range of equivalents sufficiently broad to include the process and product of the defendants?

"The Circuit Court of Appeals, considering the scope of these patents (270 Fed. 542, 545), said:

> "'The covering for the edges of the gypsum was the heart of the discovery.'

"Defendants' process and product were before the Circuit Court of Appeals upon the appeal from the order denying the preliminary injunction. The court said:

"'Respecting infringement, if that were the only matter affecting the alleged abuse of discretion on the part of the trial court, we might feel constrained on the showing by affidavits to make a tentative, but, of course, not a conclusive, finding of infringement to support a preliminary injunction. But inasmuch as new defendants brought into the litigation on the advice of counsel that the new product was not an infringement, it will be more satisfactory to have a full and final hearing on that issue in the District Court.'

"While, of course, Judge Baker was not attempting to write the decree for the District Court, as counsel for plaintiff seem to think, the statement last quoted must receive the careful consideration of this court. It is not the 'law of the case,' within any meaning of that term; and, manifestly, Judge Baker did not intend that it should be taken as such. But it is the carefully worded observation of the court which has the power to review the decrees of this court and which had twice considered the scope of these patents and the range of equivalents covered by them. Judge Baker was one of the judges who concurred in the opinion of Judge Evans in 270 Fed. Rep. 542, in which the court considered the equivalents that may be fairly recognized under these patents. And Judge Evans was one of the concurring judges in the opinion of Judge Baker from which the above statement is quoted.

"The statement was evidently made for the assistance and guidance of the District Court. I can not bring myself to think that it would have been made if the Circuit Court of Appeals had not been clearly of the opinion that plaintiff's patents show a degree of invention which entitles them to a range of equivalents broad enough to cover the process and product of the defendants.

"All the substantial facts bearing upon degree of invention and range of equivalents were before the Circuit Court of Appeals, and I shall give the statement in Judge Baker's opinion the weight which I think the Circuit Court of Appeals intended it should have.

"The tentative finding was in harmony with established principles. Pioneer patents and those for improvements so slight as to be almost immaterial form two extremes. The great majority of patents falls between these two extremes. While they do not evidence the first or the last step in the progress of the art to which they relate, they often mark signal advances and protect useful improvements. The doctrine of mechanical equivalents conditions the construction of all these patents and in determining questions concerning them the breadth of the signification of the term is proportioned in each case to the character of the advance or invention evidenced by the patent under consideration, and is so interpreted by the courts as to protect the inventor against piracy and the public against unauthorized monopoly. (*National Hollow Brakebeam Co.* v. *Interchangeable Brakebeam Co.*, 106 Fed. 693; *Yancey* v. *Enright*, 230 Fed. 641; *Columbia Wire Co.* v. *Kokomo Steel and Wire Co.*, 143 Fed. 116; *Continental Paper Bag Co.* v. *Eastern Paper Bag Co.*, 210 U. S. 405.)

"Plaintiff's invention is of a degree which entitled it to a range of equivalents sufficiently broad to cover the reversal of parts and transposition of steps shown with respect to defendant's product and process.

"6. There is nothing in the letters of Mr. Hill, the statement of Mr. Rector, or the testimony of Mr. McElroy which binds plaintiff under the principles of estoppel.

"7. There should be a decree for plaintiff on the supplemental bill, finding both patents valid and infringed, and for an accounting of damages and profits on all the claims, with costs."

Aaerial tramway, Basalt Rock Co., Napa, Calif.

Basalt Rock Company's Aerial Tramway System

ROCK is hauled at the plant of the Basalt Rock Co. near Napa, Calif., by means of two aerial tramways made by the Interstate Equipment Co., New York. This system is said to handle the material at a cost of approximately 8 cents per ton.

The quarry is located on the side of a hill. The rock is passed through primary crushers at the quarry and transported from there to the recrushing and storage plant, located about 3400 ft. away at a lower level, by means of one of these aerial tramways. This tramway is operated by one man and requires no power other than the force of gravity after being started. It transports the rock at the rate of 120 tons per hour. As shown in an accompanying photo, the tramway crosses a highway a short distance from the quarry and a protective work has been constructed to prevent any rock from falling on the roadway or passing vehicles.

The second tramway extends from the storage bunkers at the plant to the loading terminal at the railroad siding, a distance of 6200 ft. It is operated by one man and is powered by a 20-hp. electric motor.

Limestone Plant for Vermont

THE Alexander Mine and Mineral Co., Saxtons River, Vermont, has been recently organized with a capital of $50,000 to mine limestone at Cavendish, Vermont. Modern buildings are to be erected and the latest of electrically operated equipment is to be installed. The mines are rather extensive and situated near the Rutland R. R. The incorporators are G. P. Alexander and F. L. Osgood, of Saxtons River, and B. A. Robbins, of Cavendish.—Rutland (Vt.) *Herald.*

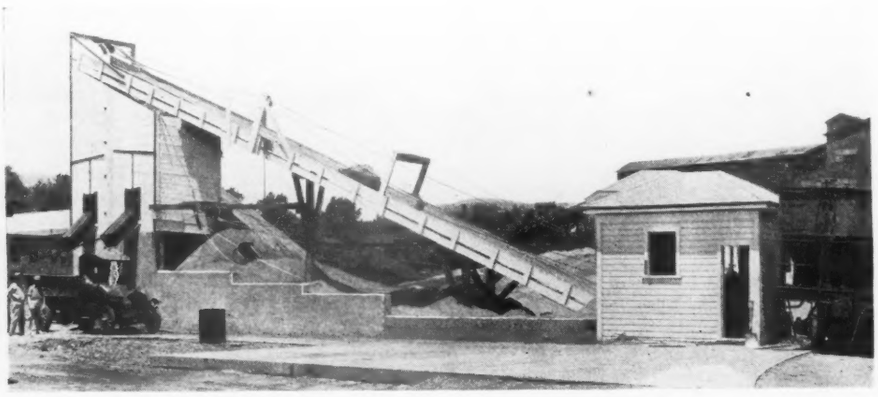
Highway crossing protection on Basalt Rock Co. aerial tramway

Hints and Helps for Superintendents

A Novel Storage and Handling System

THE Paragon Plaster and Supply Co. of Scranton, Penn., have a system for storing and handling sand that is really unique. The company manufactures wall plaster but it also deals in building materials, including sand. A part of the sand put in storage is used in the plaster mill and a part is sold.

The sand is received at the plant in drop bottom gondola cars which dump into a hopper. From the hopper the sand is drawn out by a ½-yd. Sauerman Crescent scraper bucket and pulled up an incline to storage bins. Trucks are loaded from these bins for local deliveries. When the bins are full the surplus runs over at one side and forms a pile. A second scraper bucket of the same type and size as the first mentioned drags the sand to a stockpile at one side. This scraper is also used to recover the sand from the stockpile and drag it to the belt conveyor which takes it to the plaster mill. Trucks are loaded from the stockpile by means of a wagon loader.



Storage and hauling system for sand at the plant of the Paragon Plaster and Supply Co., Scranton, Penn.

The capacity of this system is about 50 tons per hour, and the scraper on the incline operates 9 hr. per day. The second scraper operates intermittently, the larger part of the sand being loaded in the bins and then into trucks.

A letter from R. L. Merriman, the general manager of the company, says that the cost of labor and power to operate this system is from 6 to 7 c. per ton.

The incline up which the scraper is dragged is 73 ft. long and the top of the bins is 32 ft. above the ground. The bins hold 100 tons. The storage area over which the sand is distributed by the second bucket is about 100 by 150 ft.

Advised Not to Use Old Wire Rope on Well Drills

TO THE EDITOR: On page 55 of your July 25 issue, under the heading of "Hints for Superintendents," we note one entitled "New Use for Wire Rope." This hint suggests using old steel cable off of steam shovels as drilling cable on blast hole drills of the well driller type. The item states that this is somewhat harder on the machine but it is more economical than to use Manila rope.

We believe that the practice recommended there is entirely wrong. Steel cable will practically ruin a well drill if used on it any length of time, and, providing the operators are getting any efficiency out of the drill at all the wear on the sheaves alone is almost enough to offset the difference between that and Manila rope. Some of the other reasons why steel cable is not suitable for use on a blast hole drill are listed under "Drilling Cable" on page 97 of our catalog B-55.

M. B. GARBER,
Sanderson-Cyclone Drill Co.,
Orrville, Ohio.

The reference noted reads as follows:

"Quite often we receive inquiries about using steel wire rope as drilling cable on blast-hole drilling outfits in place of Manila rope. We recommend very strongly against such a procedure for several important reasons.

"The principle of the cable drilling system requires that there be some agency to provide two actions in the drilling stroke, these actions being described as stretch and spring or whip. The necessity for these actions is explained individually as follows:

"Stretch—The mechanical action of lifting and dropping the drilling tools is furnished by a crank arm. The drop of the drilling tools takes place as the crank arm moves upward while the lift of the tools takes place on the downward travel of the crank. As the crank approaches dead center on its upward motion in dropping tools, the momentum decreases because of the almost horizontal path over dead center. Unless some agent is provided to prevent this retarded motion over dead center being delivered to the tools, the momentum of the tools will be slackened so that they will be 'set' on the bottom of the hole instead of hitting it with a blow.

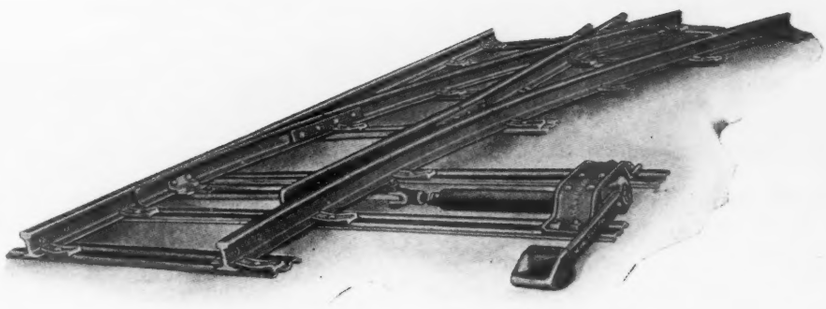
"Now, manila rope is very elastic, and when the crank arm approaches the dead center position, the momentum of the drop acquired in the upward travel of the crank together with the weight of the tools causes the Manila rope to stretch sufficiently to allow the tools to strike the bottom with a free and snappy blow. This stretch is entirely absent in any steel wire rope of the short length that would be used in blast-hole drilling.

"Where wire rope is used in deep-well drilling a short length of Manila rope—75 to 250 long, depending on total depth to be drilled—is usually spliced on the lower end of the wire rope. The short length of Manila rope is known as the cracker and supplies the requisite stretch. Occasionally, in very deep drilling—depths over 3000 feet—wire rope is used without a cracker, there being sufficient stretch in the very long length of wire rope.

"Spring or Whip—This action takes the strain off the drilling machine or rig as the tools are lifted from the bottom of the hole after their drop or blow. It is really the reaction of the stretch. The cable having been stretched in the downward travel of the drilling tools and upward motion of the crank, has a natural tendency to spring back into its original form which causes the tools, in a way, to bounce off of the bottom after having struck a free blow. While this spring is taking place, the drilling crank is on its downward motion, which motion lifts the tools. This downward motion is assisted by the bounce of the tools caused by the springing of the cable, and thus relieves the drilling machine of the terrific strain of lifting a dead load which would be the condition if the spring or whip action were not supplied. Wire rope having no stretch consequently lacks the springing or whipping characteristic.

"We and other drill manufacturers have spent a large amount of money and time in an effort to devise some mechanical means of supplying the desired stretch and spring as furnished by Manila rope but up to the present time no successful appliance has

been developed. While it is possible to operate a blast hole drill with wire rope, the damage done to the machinery and parts due to the excessive strains, as just explained, and the much slower drilling speed, will result in ultimate costs much greater than operating with Manila rope, even taking into consideration the fact that wire rope is cheaper and has a somewhat longer life than Manila rope."



Type of switch used at Iowa Limestone Co. plant

Switch That May Be Thrown from the Locomotive

THE "Hint and Help" under the above caption in our issue of July 25 brought so many inquiries to R. C. Fletcher, vice-president and general manager of the Iowa Limestone Co., Alden, Iowa, that we desire to supplement the information already published with enough more to make clear the points which correspondents are in doubt about.

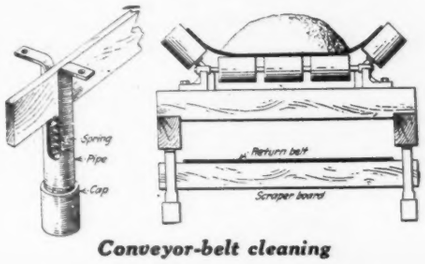
Showing the two switches, each of which is provided with the arrangement described

We quote from the July 25 issue: "Four posts were placed between the track at the switch point and a rope extended between them, each terminal forming a "Y," and at the terminal nearest to the switch having one end running over a pulley and attached to the handle of the switch throw. Thus, as the operator goes by, it is only necessary for him to pull on the rope, and the switch is adjusted in any position that he wants it. He does not have to decrease the speed of the locomotive at all in order to make this switch function properly. The action is much the same as that of the conductor giving the motorman of a street car a signal to go ahead. One pull of the rope and the switch is thrown.

The cut in the upper right-hand corner of this page illustrates the type of switch throw used and makes plain that the locomotive driver must give the cord enough of a yank to throw the switch lever past the high point or dead center. It can, of course, be "flopped" either way by a yank on the rope over the track. The advantage is that the switch may be thrown without stopping the locomotive. Ordinarily, of course, a switchman would not be employed, but it would be necessary for the driver to stop the locomotive and throw the switch for himself. In the course of a day the time thus lost would be very considerable, not to mention the human energy, that should be available for other things.

Cleaning Conveyor Belts

WITH soft, clayey materials, more or less fine material accumulates on the surface of belt conveyors and, although a part of this accumulation is discharged with the material, part remains on the belt and is distributed along the runways. At El Paso smelter, scraper boards are placed under the return belt near the discharge end for the purpose of cleaning the belt as much as possible. These consist of a ½-in. board, 4 in. in width, held in two supports and pressed against the return belt by springs. The weight of the belt causes it to scrape over the board clearing itself. The accompanying illustration shows in detail the arrangement.—*Engineering and Mining Journal-Press.*



Conveyor-belt cleaning

Two Good Hints for Coupling Dredge Pipe Lines

By H. E. ROBINSON
Manager Central Michigan Gravel Co., Lansing, Mich.

WE operate a dredging plant using rubber sleeves to connect the discharge pipe. We have found that an ordinary ratchet fence stretcher makes an ideal device for pulling two lengths of pipe together and holding them while clamps are being applied. We also have discovered that ordinary rubberoid roofing makes satisfactory gaskets on this pipe line where flanged couplings are used and where the pipe line is stationary. We simply insert a square of this roofing and drive the bolts through it. Before insertion we cut two slits at right angles in the center of the square and the force of the water does the rest. This is as useful as rubber packing and very inexpensive.

Hints Are Worth $5

THE superintendent-author of the above letter got $5 for his hints. We are sure they will prove to be worth $5 and more to many readers faced with similar conditions. Those who profit by these helpful suggestions owe it to the craft to give one or two in return. ROCK PRODUCTS editors welcome them and pay $5, or more, for each. It only means a few moments' time and a 2 cent stamp to earn your $5.

Financial News and Comment

North American Cement Corporation Financing

A GROUP of five banking houses with offices in various American cities recently offered $6,000,000 in sinking fund gold debentures of the new North American Cement Corporation. The total authorized issue is $15,000,000. The bonds are dated September 1, 1925, and are due September 1, 1940. The rate of interest is 6½%, the interest payable semi-annually March 1 and September 1. They were sold by the bankers at 98½%, to yield the purchaser 6.66%.

The bonds are redeemable as a whole or in part at the option of the company at any time prior to maturity upon thirty days' notice, at 105 if redeemed on or before September 1, 1930; at 104 thereafter if redeemed on or before September 1, 1933; at 103 thereafter if redeemed on or before September 1, 1936; at 102 thereafter if redeemed on or before September 1, 1939; and thereafter, but prior to maturity, at 101, in each case with accrued interest. The National City Bank of New York is trustee. This series (Series A) upon issuance, will bear a detachable warrant entitling the holder thereof to purchase common stock of the company, at $50 per share, at any time prior to September 1, 1935, in the ratio of 20 shares for each $1000 principal amount of debentures.

The following information from F. W. Kelley, president of the company was used by the bankers:

BUSINESS AND PROPERTIES: The North Americant Cement Corporation was incorporated under the laws of Delaware for the purpose of owning and operating plants engaged in the manufacture of portland cement and kindred commodities. It will be the successor by purchase to the Security Cement and Lime Co. and the Helderberg Cement Co. These companies own and operate three plants located at Hagerstown, Md., Berkeley, W. Va., and Howes Cave, N. Y., all of which are successful, well established, operating units.

EARNINGS: Combined net income, after depreciation and depletion, of the properties to be owned by the company upon completion of transactions incident to new financing, for the year ended December 31, 1924, as certified to by Lybrand, Ross Bros & Montgomery, was $1,371,915, or over 3½ times annual interest requirements of this issue of Series A debentures. Such net income for the three years ended December 31, 1924, averaged $971,019 per annum. At the present rate of production, earnings for 1925 indicate a substantial increase over those for 1924.

ASSETS: The consolidated balance sheet of the company, as of May 31, 1925, with adjustments to give effect to the proceeds of new financing and to the transactions incident thereto, as certified by the auditors,

RECENT QUOTATIONS ON SECURITIES IN ROCK PRODUCTS CORPORATIONS

(These are the most recent quotations available at this printing. Revisions, corrections and supplemental information will be welcomed by the editor.)

Stock	Date	Par	Price bid	Price asked	Dividend rate
Alpha Portland Cement Co. (common)**	Aug. 14	100	129¾	132	1½% quar.
Alpha Portland Cement Co. (preferred)**	Aug. 14	100	105	.....	1¾% quar.
Arundel Corporation (sand and gravel—new stock)	Aug. 14	No par	34⅝	35½	30c quar. July 1
Atlas Portland Cement Co. (common)	Aug. 14	No par	52	52⅜	50c quar.
Atlas Portland Cement Co. (preferred)**	Aug. 14	33⅓	44	48	2% quar. July 1
Bessemer Limestone and Cement Co. (common)‡	Aug. 14	100	130	140	1½% quar. July 1
Bessemer Limestone and Cement Co. (preferred)‡	Aug. 14	100	100	108	1¾% quar. Aug. 15
Bessemer Limestone and Cement Co. (convertible 8% notes)‡	Aug. 14	.....	125	135	8% annual
Boston Sand and Gravel Co. (common)	July 31	100	71	71	2% quar. July 1
Boston Sand and Gravel Co. (preferred)	.....	.....	.....	.....	1¾% quar. July 1
Boston Sand and Gravel Co. (1st preferred)	.....	.....	.....	.....	2% quar. July 1
Canada Cement Co., Ltd. (common)	Aug. 20	100	108¾	109	1½% quar. July 16
Canada Cement Co. Ltd. (preferred)	Aug. 4	100	78	78½	1¾% quar. Aug. 15
Canada Cement Co., Ltd. (serial bonds)	June 30	.....	102½	.....	3% semi-annual
Charles Warner Co. (lime, crushed stone, sand and gravel)	Aug. 14	No par	25⅞	26	50c quar. July 10
Charles Warner Co. (preferred)	Aug. 3	100	98	102	1¾% quar. July 23
Dolese and Shepard (crushed stone) (a)	Aug. 20	100	52½	55	1½% quar.
Giant Portland Cement Co. (common)**	Aug. 14	50	27	30	
Giant Portland Cement Co. (preferred)**	Aug. 14	50	48	50	3½% semi-ann. June 15
Ideal Cement Co. (common)‖	Aug. 20	No par	65	75	$1 quar. June 30
Ideal Cement Co. (preferred)‖	Aug. 20	100	92	97	1¾% quar. June 30
International Cement Corporation (common)	Aug. 19	No par	66	66½	$1 quar. June 30
International Cement Corporation (preferred)**	Aug. 14	100	103½	104½	1¾% quar. June 30
International Portland Cement Co., Ltd. (preferred)	Mar. 1	.....	30	45	
Kelley Island Lime and Transport Co.	Aug. 19	100	105	105	2% quar. July 1
Lawrence Portland Cement Co.**	Aug. 14	100	107	115	2% quar.
Lehigh Portland Cement Co.**	Aug. 14	50	86	91	1½% quar. Apr. 1
Michigan Limestone and Chemical Co. (common)‖	Aug. 3	.....	23	25	
Michigan Limestone and Chemical Co. (preferred)‖	Aug. 3	.....	23	25	1¾% quar. July 15
Missouri Portland Cement Co.	Aug. 20	25	67	68	25c quar. Aug. 1; 25c ex. Aug. 1.
Missouri Portland Cement Co. (serial bonds)	May 29	.....	104½	104½	3¼% semi-annual
Monolith Portland Cement (common)	Aug. 13	.....	7	7½	
Monolith Portland Cement (units)	Aug. 13	.....	21	23	
Monolith Portland Cement (preferred)	Aug. 13	.....	6½	7	
Pacific Portland Cement Co., Consolidated	Aug. 16	.....	.....	80¼	
Pacific Portland Cement Co., Consolidated (secured serial gold notes)§	July 23	.....	99½	101	3% semi-annual Oct. 15
Peerless Portland Cement Co.*	Aug. 3	10	8½	9	
Petoskey Portland Cement Co.*	Aug. 3	10	8¾	9½	1½% quar.
Pittsfield Lime and Stone Co. (preferred)	.....	100	.....	.....	2% quar. Apr. 1
Rockland and Rockport Lime Corp. (1st preferred)	Aug. 17	100	98	.....	3½% semi-annual Aug. 1
Rockland and Rockport Lime Corp. (2nd preferred)	Aug. 3	100	70	.....	3% semi-annual Aug. 1
Rockland and Rockport Lime Corp. (common)	Aug. 3	No par	70	.....	1½% quar. Aug. 1
Sandusky Cement Co. (common)*	Aug. 19	100	108	108	2% quar. July 1
Santa Cruz Portland Cement Co. (bonds)	July 18	.....	.....	.....	6% annual
Santa Cruz Portland Cement Co. (common)	Aug. 16	50	66	.....	$1 Apr. 1
Superior Portland Cement Co.	Mar. 1	100	.....	120	
United States Gypsum Co. (common)	Aug. 20	20	186	189	2% quar. Sept. 1; $1 ex. Sept. 15
United States Gypsum Co. (preferred)	Aug. 20	100	115	117	1¾% quar. June 30
Universal Gypsum Co. (common)†	Aug. 20	No par	20¾	23	
Universal Gypsum Co. (preferred)†	Aug. 5	.....	76	.....	1¾% quar. Sept. 15
Universal Gypsum Co. (1st mortgage 7% bonds)†	Aug. 5	.....	99	(at 6½%)	
Wabash Portland Cement Co.*	Aug. 3	50	60	100	
Wolverine Portland Cement Co.	Aug. 3	10	10	12	2% quar. Aug. 15

*Quotations by Watling, Lerchen, & Co., Detroit, Mich. **Quotations by Bristol & Bauer, New York.
†Quotations by True, Webber & Co., Chicago. ‡Quotations by The Valley Investment Co., Youngstown, Ohio.
§Quotation by Freeman, Smith & Camp Co., San Francisco, Calif. ‖Quotations by Frederic H. Hatch & Co., New York.
(a) Quotations by F. M. Zeiler & Co., Chicago, Ill.

shows current assets of over 7½ times current liabilities and total net assets of over $11,257,000 applicable to these debentures, or over $1,875 for each $1,000 debenture of Series A presently to be outstanding.

PROVISIONS OF ISSUE: The indenture will provide that, without the consent of the holders of 75% of these debentures, the company will not create any mortgage or other funded debt (with the exception of current borrowings made in the ordinary course of business and maturing not later than one year from date), unless these debentures are secured equally and ratably. The company, however, shall be permitted to acquire additional property subject to existing mortgages or liens, provided the aggregate principal amount of additional debentures issued therefor and of such existing mortgages or liens shall not exceed 60% of the cost or fair value (whichever is lower) of such property.

MANAGEMENT: Frederick W. Kelley, who will be president of the new company, has been executive head of the Helderberg Cement Co. for over 25 years. Loring A. Cover will become vice-president and John J. Porter, vice-president and general manager, of the North American Cement Corporation. These executives, together with Robert C. Pruyn of Albany, Nicholas F. Brady of New York, and others closely affiliated with the constituent companies will be included in the directorate of the new company.

SINKING FUND: The indenture will provide for a minimum sinking fund of $120,000 per annum payable in monthly installments of $10,000, and an additional sinking fund, payable annually, equivalent to the amount by which 20% of the net earnings of the company, after depreciation, depletion, interest, taxes and preferred dividends, for the preceding fiscal year, shall exceed the sum of $120,000.

STOCK PURCHASE WARRANTS: Each Series A debenture, upon issuance, will bear a detachable warrant entitling the holder thereof to purchase common stock of the company, at $50 per share, at any time prior to September 1, 1935, in the ratio of 20 shares for each $1000 principal amount of debentures. Combined net income of the properties to be owned by the company, for the year ended December 31, 1924, as above, after deducting annual interest and preferred dividend requirements of the Series A debentures and preferred stock presently to be outstanding and federal taxes computed at the present rate, amounted to $614,176, equivalent to over $4.91 per share on the 125,000 shares of common stock presently to be outstanding.

Legal details in connection with this issue will be passed upon by Beekman, Bogue, Clark & Griscom of New York City. The properties to be acquired have been appraised and reported on by Ford, Bacon and Davis, Inc., of New York City, Hunt Engineering Co. of Kansas City, Mo., and H. E. Brown, consulting engineer, of New York City.

The company has made application to list these bonds on the New York Stock Exchange.

The banking group by which the bond issue was underwritten comprised: Hemphill, Noyes and Co., Dominick and Dominick, Hornblower and Weeks, Eastman, Dillon and Co. and Mitchell, Hutchins and Co., Inc.

The issue was all sold before noon of the day they were first placed on sale.

Kansas Sale of Missouri Rock Asphalt Company Bonds Authorized

KANSAS STATE CHARTER BOARD has granted permission for the sale of $250,000 in bonds of the Missouri Asphalt Rock Co. (Incorporated in South Dakota). Mrs. M. T. Hufty is president of the company and Kansas offices are at Fort Scott. The company owns lands in Missouri near Fort Scott, Kans., and is producing a quantity of high-grade rock asphalt. It is reported to have acquired additional acreage under lease.—*Ft. Scott (Kans.) Tribune.*

United States Gypsum Extra Dividend

THE United States Gypsum Co. has declared an extra dividend of $1 a share, payable September 1 to stock of record August 22. The directors at their meeting also declared the regular quarterly dividends of 40 cents a share on the common stock and $1.75 a share on the preferred stock, payable September 30 to stock of record September 15.

The U. S. Gypsum Co. common stock has jumped from our July 21 quotation of 164 to 188 as of August 19. This is accounted for by the recent U. S. District Court decision in the wall-board infringement suit, published in full elsewhere in this issue.

Canada Cement Touches New High

THERE is little to add to our article of some days ago on Canada Cement common. The issue sold then at 105, recently it forged ahead to 110, closing ¼ point lower. It is interesting to note that the issue is now selling about 100 points above its low of 15 the year that it was listed (1910).

As was stated previously, there is very little stock available on the street, not nearly enough to satisfy the ever broadening investment demand, whilst, for specutative trading, it presents quite an interesting situation: the "short" runs considerable risk due to scarcity of supply, whilst those fancing the "long" side will undoubtedly see sharp rises in market prices whenever there is a demand for the issue.

The large order which the company has recently secured is no doubt responsible for the increased demand and the quick rise the past few days. Being one of the best of our industrial issues, it will undoubtedly strike higher levels as times goes on.

International Cement Corporation Earnings

THE INTERNATIONAL CEMENT for the quarter ended June 30 earned a net income of $1,110,603 after charges, depreciation and federal tax. This is equal after preferred dividends to $2.62 a share on 400,000 shares of no par common against $731,938, or $1.64 a share in the preceding quarter, and $678,291 or $1.76 a share on 364,167 shares outstanding in the second quarter of 1924. For the six months ended June 30, net income was $1,824,541 or equal after preferred dividends to $4.26 a share on the common, against $1,120,303 or $2.87 a share in the first half of the previous year.

Universal Portland Cement Developments in 1924

THE recent annual report of the United States Steel Corporation refers to its subsidiary, the Universal Portland Cement Co., as follows: "Outlays aggregating $1,853,485 were made during the year for a considerable range of improvements at the company's various plants in modernizing equipment and facilities, installing dust collectors, etc., both for the purpose of increasing capacity and reducing cost of operation."

Celite Products Company Capital Increase

THE stockholders on February 3 last changed the authorized common stock (all outstanding) from 10,000 shares, par $100, to 40,000 shares of no par value. The company also has outstanding 6000 shares of Class "A" preferred stock (par $100), and 4000 shares of Class "B" preferred stock (par $100).

An initial distribution of 1% was made on the common shares on February 1 last.

Celite Products Dividends Declared

THE Celite Products Co., Los Angeles, Calif., has declared an extra dividend of 25 cents on its common and quarterly dividends of 25 cents on the common and 1⅞% on its class A and B preferred stock payable August 1 to the holders of record July 25.

Decrease of Employment in Illinois Lime and Cement Industry

REPORTS from the Illinois State Department of Labor shows a general decrease of employment for the first half of 1925 of about 6% in the lime and cement industry in Illinois. These figures are slightly lower than 1924 and 16% below those of 1923.—*Chicago Journal of Commerce.*

Warrior Cement Corporation Takes Over Gulf States Plant

Reorganization by Chattanooga Men Formerly Interested in Signal Mountain Company

REORGANIZATION of the Gulf States Portland Cement Company has been effected recently through the organization of the Warrior Cement Corp., which has acquired the plant and properties of the Demopolis, Ala., company. Announcement of purchase of the old company and completion of the organization of the new was made July 28.

Officers of the Warrior Cement Corp. are Clarence S. Steward, Chattanooga, chairman of the board of directors and treasurer; A. C. Deer, Chattanooga, president; A. Tonnar, Vicksburg, vice president; A. B. Wilder, Minneapolis, vice president; H. I. Brusia, Mason City, Ia., vice president, and F. W. Boley, Chattanooga, secretary. The officers, with the following, constitute the board of directors: J. W Winall, Dubuque, Ia.; Ole K. Olsen, New Orleans; Paul S. Steward, Chattanooga; F. A Stephenson, Mason City, Ia., and Charles Closz, Webster City, Ia.

The new company is incorporated under the laws of Delaware, with a capitalization of $750,000 of preferred stock and 20,000 shares of no par common stock. The preferred stock has all been subscribed by the stockholders of the old company. Fifteen-year closed first mortgage gold bonds to the amount of $750,000 will be placed to finance erection of a new plant at Demopolis. The bonds will be handled through Luckadoo and Elmore, of Chattanooga, $300,000 having already been pledged. One-half share common stock will be given with each $100 bond bought.

Property of the Warrior company consists of 500 acres in Marengo county, located on both the Warrior river and the Southern Railway system. The plant with the new kiln, which will be in operation on October 1, will have a capacity of 1800 bbl. of cement a day.

This output will be continued during the construction of the new plant, which will take about ten months, and the output will then be in the neighborhood of 3000 bbl. per day. Provisions have been made in the new plant for space to install two additional kilns after it is in operation.

Mr. Deer and his associates are confident that with the splendid rail and water facilities the ultimate capacity of the mill can be developed up to 2,000,000 bbl. per year. The Warrior company will take full advantage of the 8-ft. depth channel of the Warrior river to ship its product by barge in bulk to Mobile, New Orleans and Tampa. Suitable storage silos and packing facilities will be built at New Orleans and Tampa. Special steel barges will be used to transport the cement, which will be pumped into and out of the barges by the Kenyon pumping system, the latest development in handling cement, by means of which the cement is made to flow through pipes very much as water is carried.

General offices of the Warrior corporation will be in the Provident building, Chattanooga's newest skyscraper. The present operating and office force at the plant will be enlarged as the increased output warrants.

Mr. Deer, who heads the new company, came from Jackson, Mich., about three years ago, at that time being vice president and general manager of the Peninsular Portland Cement Co., and vice president of the Cowham Engineering Co. of Chicago. He made the general layout and superintended the construction of the Signal Mountain Portland Cement Co. plant as manager of construction. Mr. Deer was then made manager and organized the operating and sales forces serving in this capacity until March 15 of this year.

Clarence S. Steward has been a resident of Chattanooga since 1888 and has been identified with local industrial interests during his entire time. He is president of the D. M. Steward Manufacturing Co., one of the city's oldest manufacturing enterprises. He served two years as active vice president and director of finance and credits of the Signal Mountain Co., resigning this office in January. He is still a large stockholder of the company.

Mr. Boley is an expert cement accountant and office manager, having been formerly treasurer of the Cowham Engineering Co., secretary of the Peninsular company and is at present auditor for the Signal Mountain Co., resigning to accept the new position.

Mr. Tonnar is a well-known capitalist and business man. Mr. Wilder is well known in Minneapolis, being president of the Lyle Culvert and Road Equipment Co., president of the Stockland Road Machinery Co., and the University State Bank. Both were officers of the Gulf States Co., the former being president.

Mr. Prusia is senior member of the firm of Roy E. Prusia Co. and vice president of the Hawkeye Supply Co., as well as being identified with the agricultural interests of northern Iowa. Both Mr. Closz and Mr. Stephenson are well known in Chattanooga due to their previous connection with the Signal Mountain Co. Mr Olsen, another of the directors of the company, is nationally known as an engineer and constructor.

Paul S. Steward is a well-known young business man of this city. He is treasurer of the D. M Steward Manufacturing Co. and was formerly assistant manager and purchasing agent for the Signal Mountain Co., resigning his position early this year.—*The Dixie Manufacturer.*

Superior Cement Enlarges Plant

THE Superior Portland Cement Co. of Seattle, with plant at Concrete, Wash., has started construction of a new kiln which will increase the plant capacity about 25 per cent or to 5000 bbl. per day.

The new kiln will be located just north of the present kilns, and the work of building the concrete foundations is now well under way. The kiln will be of the same size as the two largest kilns now in use, being 8x193 ft. While the other two kilns have concrete stacks, the new kiln will have a stack of steel, lined with brick, and this chimney will not be quite as high as the concrete stacks. The steel work of the chimney is nearly all in place and the work of placing the lining brick has already been started.

In addition to the new kiln, another Raymond mill and one more coal pulverizing mill will be installed, and it is expected that some additional machinery will have to be installed when the new kiln is in operation. No changes will be made in the finish end of the mill at this time, as the capacity of the grinding mills is large enough to handle the increased output of clinker.

It is planned to rush the work as rapidly as possible, and it is hoped to have the new machinery in operation within a month. The equipment and work of installation will represent an investment of about $75,000.—*Concrete (Wash.) Herald.*

Increase in Production of Talc in Canada During 1924

FINALLY revised statistics on the production of talc and soapstone in Canada during 1924 as reported by the Dominion Bureau of Statistics under the authority of the Hon. Thos. A. Low, Minister of Trade and Commerce, show that there was a slight advance in the production of talc and soapstone in Canada during 1924. Sales for the year totaled 11,332 tons worth $154,480, as against 10,366 tons at $150,507 in 1923.

Imports figures from April 1, 1924 to the end of the calendar year showed a total of 2,969 tons of talc and soapstone brought into Canada in that period. Exports were slightly higher than those recorded in 1923.

Editorial Comment

A Monument to an Industry

As announced elsewhere in this issue, contracts have been let for a building in Chicago to be owned and occupied exclusively by the Portland Cement Association. It is, so far as any of us knows, the first structure of its kind, built and owned by a trade association. It will be a monument to the American Portland Cement Industry—indestructible and self-evident proof that "co-operation is better than cut-throat competition."

We doubt if there is another instance in industrial history of a group of business men working together for twenty-odd years with such obvious and tangible results *for the good of a whole industry,* of which they were a part. To be sure the membership of the Portland Cement Association includes a great majority of all the cement manufacturing companies in North America, but it *never* has included *all.* But like other groups of individuals its path has not been one of plain and easy sailing. The members of the Portland Cement Association, like the members of every association and organization, have included warm, active progressive members, cold, conservative members, and just plain, indifferent members.

Secretary of Commerce Hoover once said that the great men of the world were not those who possessed and preached great ideals, for many of us have high ideals; but those who take things as they are and by slow but sure progressive steps, lead us on to better things and higher ideals. Such men have courage, faith and patience and they are a great asset not only to industry but to society as a whole. The history of the Portland Cement Industry proves it has many such leaders.

But the Portland Cement Association has not accomplished any more than every trade association can accomplish under equally able leadership and high ideals.

The building of the Portland Cement Association's home should prove an inspiration to the leaders in all branches of industry, for the Portland Cement Association has amply demonstrated that whole-hearted devotion to public service is individually profitable. In other words it has proved to be literally true that: "He profits most who serves best," and to this might be added that: "He serves best who serves through organized efforts."

The record of the Portland Cement Association is enviable from other angles. It never has resorted to unfair, unmoral, or unethical methods of promotion. It has never spent its energies or its money to knock the other fellows' material; it has consistently and persistently concentrated on the virtues of its own; it has let the other fellow assume the defensive; which is almost invariably the weaker side in any competition—and the results are as self-evident as will be the handsome new Association Home in Chicago.

Sauce for the Goose, Etc.

The great emphasis being placed on "a responsible contractor" by the Associated General Contractors of America in their campaign to eliminate irresponsible contractors and the day-labor system in the construction of public works recalls to our mind two ancient proverbs: (1) "What is sauce for the goose is sauce for the gander"; and (2) "It's a poor rule that does not work both ways." Now the *official text* of the definition or rule of the A. G. C. committee is announced as follows:

"THE RESPONSIBLE CONTRACTOR—Whether an individual, firm or corporation, must possess, as a minimum of requirement, three essential qualifications, as follows:

"INTEGRITY—He must consistently and persistently comply with the spirit as well as the letter of his contracts and must handle every transaction with fairness and honor.

"SKILL—He must possess the necessary technical knowledge and practical business experience, as applied to his particular form or group of undertakings, to enable him to carry them to completion in a workmanlike and economical manner.

"RESPONSIBILITY—He must possess cash or credit to meet all his commitments, also the equipment and organization for the satisfactory performance and completion of his undertakings."

Since contractors are asking their clients, or patrons, to apply these tests to the firm or individual who proposes to do their construction work it seems only fair for producers of sand, gravel and crushed stone to ask the contractors to apply exactly the same tests or qualifications to the men from whom they buy their construction material.

More than one contractor's reputation for integrity and skill has been called into question, or ruined, by a short-sighted policy of using local untried aggregates, or by contracting for a supply of aggregate from an irresponsible producer. Certainly if the contractors are willing to proclaim from the house tops the necessity of care in the selection of contractors, they ought to be able to see that the same rule applies to the selection of the sub-contractors who furnish the materials; and that no manner of skill, however widely advertised, can make good for the use of faulty materials, or a failure in material delivery service.

H. E. Hilts Back in Cement Industry

H. E. HILTS, former general manager of the Portland Cement Association and recently deputy engineering executive and deputy highway commissioner of the State of Pennsylvania, has been appointed assistant manager of the Virginia Portland Cement Co., with headquarters at Norfolk, Va. The Virginia Portland Cement Co. is one of the

H. E. Hilts, assistant manager, Virginia Portland Cement Co.

southern subsidiaries of the International Cement Corporation of New York City.

Texas Rock Asphalt Companies May Combine

ACCORDING to a report from the *Uvalde (Texas) News*, consolidation of the rock asphalt companies in Uvalde and Zavola counties is expected shortly. The largest holdings are those of the Uvalde Rock Asphalt Co., headquarters in San Antonio, and comprise about 7500 acres. J. B. Smith, president of the company, admitted having heard of the merger movement but stated that it was too early to discuss or confirm such rumors.

Lawrence Portland Cement Company to Open New Limestone Quarry

FROM a report in the *Lebanon (Penn.) News*, the Lawrence Portland Cement Co., N. Y. plant at Siegfried, Penn., has taken options on 800 acres of land at Lebanon, Penn. These options were secured by Albert Herr of the Spring Creek Limestone Co. for the Lawrence Co. Test boring has begun and if the limestone deposit is up to expectations, the final transfer of property will be made and work started on the quarrying of the rock. Increased production of cement by the Lawrence company is the reason for the developments of these lands.

Rate Discrimination Charges Dismissed

FAILING to find any discrimination shown against the Union Rock Co. and American Crushed Rock Co. of California by the Santa Fe R. R., the California Railroad Commission yesterday dismissed charges brought against the railroad by the rock concerns. The companies alleged that rates on rock, sand and gravel from points other than their shipping points were lower and therefore unjust and discriminatory. After investigating the charges at several hearings the commission dismissed the complaints.—*Los Angeles (Calif.) Times.*

Security Cement and Lime-Helderberg Cement Co. Merger Announced

A MERGER of the Security Cement and Lime Co. and the Helderberg Cement Co., to be known as the North American Cement Corp., with assets of over $12,000,000, is announced. The combine will bring under one management properties having a productive capacity of almost 3,000,000 barrels a year and serving the Atlantic seaboard. A program of expansion now under consideration contemplates the acquisition of additional plants. Sponsoring the new consolidation are Frederick W. Kelly, for 25 years head of the Helderberg Cement Co., who will be president of the consolidated company, and Loring A. Cover, for 15 years president of the Security Cement and Lime Co., who will be vice president; Robert G. Pruyn and Nicholas F. Brady are among the directors.—*Chicago Journal of Commerce.*

Lindley C. Morton to Stay at Birmingham

LINDLEY C. MORTON, president of the Phoenix Portland Cement Co., which recently sold its southern properties to the Alabama Portland Cement Co., a subsidiary of the International Cement Corp., is remaining in Birmingham. He has opened offices at 1509-10-11 Age-Herald building.

Mr. Morton has been joined by R. J. Hawn, who was superintendent of the Phoenix plant at North Birmingham.

Frank Traynor Resigns from Lehigh to Accept Florida Position

FRANK TRAYNOR, southern sales manager for the Lehigh Portland Cement Co., at Birmingham, has resigned to accept the position of general manager of the I. E. Schilling Co., a Miami building supply firm.

The resignation will become effective about September 1. Mr. Traynor left Birmingham recently for the eastern offices of the Lehigh company to arrange for the change.

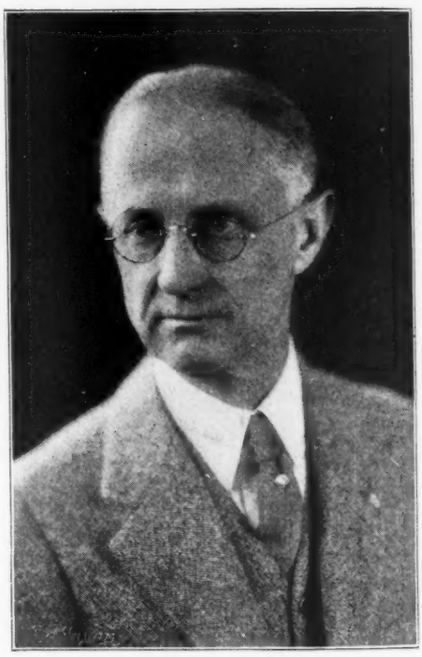
Mid-West Crushed Stone Association Endorses N. C. S. A. Plans

THE comprehensive plans of the National Crushed Stone Association for an expert organization for research and engineering work in connection with the development and promotion of quarry products were laid before the recently organized Mid-West Crushed Stone Association on August 14 by Otho M. Graves, president of the National Association. President Graves spoke for about two hours in his usual logical and eloquent manner, with the result that Illinois and Indiana quarry owners have agreed to help finance the National Association in an adequate way.

Col. O. P. Chamberlain, general manager of the Dolese and Shepard Co., Chicago, is chairman of the new Mid-West Association. Fred C. Murphy, secretary of the Brownell Improvement Co., Chicago, is secretary.

E. J. Krause, Member of Executive Committee, N. C. S. A.

E. J. KRAUSE, president of the Columbia Quarry Co., St. Louis, Mo., has been elected a member of the executive committee of the National Crushed Stone Association, succeeding Norman L. Hely, president of the



E. J. Krause, president of the Columbia Quarry Co., St. Louis, new member of the executive committe, N. C. S. A.

Edward Hely Stone Co., Cape Giradeau, Mo., who resigned because of the pressure of private business.

Mr. Krause is a past-president of the National Crushed Stone Association and has been active in its affairs since its inception.

Proposed Eastern Lime Freight-Rate Adjustment

Examiner's Report on Controversy Between Shippers in Pennsylvania and Central States

IN a report on No. 16170, Eastern Lime Manufacturers' Traffic Bureau et al. vs. Akron & Barberton Belt Railway et al., Examiner Warren H. Wagner and J. P. McGrath said the Interstate Commerce Commission should find rates on lime, except lime having no commercial value for chemical or building purposes, from producing points in Maryland, Pennsylvania, West Virginia, Virginia and Ohio, to central territory, unreasonable. They proposed changing the commodity descriptions and making rates on lime not having value for chemical or building purposes only 80% of rates on lime having value for such purposes, to destinations in 60% and 67% territories where the steel mills are located and where much lime not usable in building or in chemical industries is used. They said there was no warrant for changing the groups, but that the rates between the groups approved in lime from eastern trunk line points, 93 I. C. C. 617, which they called the suspension case, to 60% and 67% territories should be adjusted on a differential basis, using group 3 as the base. They proposed a scale from the Ohio producing points. The report also covers a sub-number, Washington Building Lime Co. et al. vs. Same.

The examiner said no evidence was offered as to the rates to destinations in West Virginia, other than to points in central territory, and that their report would deal only with the latter.

Complainants are corporations and partnerships engaged in the manufacture and sale of lime. They alleged that the interstate rates from producing points in the states mentioned were unreasonable.

A complaint assailing the intrastate rates on lime from producing points in Pennsylvania to 60% and 67% territories having been filed with the Pennsylvania commission, the state and the Federal commissions held a joint hearing. This report, however, dealt only with the intrastate rates. Complainants, the examiners said, were not in accord as to all of the relief sought therefore, for convenience, those complainants which were in accord with the Eastern Lime Manufacturers' Traffic Bureau and Lime Industries of Virginia were referred to as the Bureau and those having divergent views were referred to only by individual names.

Distance scales were sought by the Bureau. They were opposed by intervening Ohio lime shippers on the ground that for the long distances they would unduly prefer the eastern producers and prejudice the producers in central territory. The examiners said the scale proposed, it would be noticed, increased at the rate of 1 cent for each 100 mile block beyond 200 miles for a minimum of 60,000 lb., and between 200 and 400 miles and beyond 500 miles for a minimum of 40,000 lb. The examiners said that that was a lesser rate of progression than observed in distance scales prescribed by the commission in a number of cases, including those on cement in Western Cement Rates, 48 I. C. C. 201, and Atlas Portland Cement Company vs. C. B. & Q. R. R., 81 I. C. C. 1. The rates sought by the intervening Ohio lime shippers, they said, were based substantially on the present Ohio rates from Woodville, Ohio, to a number of important lime consuming points in that state, and were, in some instances, the same as, and in others, from half a cent to 2 cents lower than those in the Mitchell case scale for equal distances and in all instances higher than the rates sought by the Bureau for a minimum of 60,000 pounds. The interveners contended the rates on lime from the eastern points of origin to central territory should be on a higher level than those between points in that territory, citing the National Paving Brick Manufacturers' case, 68 I. C. C. 213, and lime from eastern trunk line points, 93 I. C. C. 617, the latter called by the examiners the suspension case.

The examiners said the commission's decisions in the Mitchell case, 85 I. C. C. 341, and the suspension case, were relied upon by the eastern carriers in support of the reasonableness of the present rates from the eastern points of origin.

In the Mitchell and suspension cases, the commission divided certain of the Pennsylvania, Maryland, Virginia and West Virginia producing points into three points, Group 3 embracing among others the points referred to in the Mitchell case, that case taking its name from the Indiana town where the Lehigh Lime Company's plant is located, the other producing points being known as Groups 1 and 2.

In disposing of the case the examiner said the commission should find as follows:

That for rate purposes, lime should be described as lime, n. o. s., and as agricultural or fluxing lime having no commercial value for building or chemical purposes.

That the evidence does not warrant any change in the present grouping of the eastern points, but that the rates between the groups approved in the suspension case to 60 and 67% territories should be adjusted on a differential basis, using group 3 as the base group.

The approximate average distances from representative producing points in group 3, compiled from exhibits of record, are, 260 miles to Pittsburgh, 327 miles to Youngstown, 322 miles to Steubenville, 324 miles to Wheeling, 397 miles to Erie, and, as found in the suspension case, 339 miles to Sharon.

The interstate rates on lime, in carloads, except lime which has no commercial value for building or chemical purposes, from points in group 3, as hereinbefore described, are, and for the future will be, unreasonable, to the extent that they exceed, or may exceed 15.5 cents to Pittsburgh, and points in the Pittsburgh district, 17 cents to Youngstown, Sharon, Steubenville, Wheeling and Erie, and to other points in 60 and 67% territories rates that will be in harmony with the rates to the points above specifically named; that the rates from points in groups 1 and 2, as hereinabove described, are, and for the future will be, unreasonable, to the extent that they are less than 1 cent and 0.5 cent, respectively, lower than the rates hereinabove specified from group 3; that the interstate rates assailed from the other points of origin are, and for the future will be, unreasonable to the extent they exceed, or may exceed, by more than 0.5 cent from points in the Bloomsburg group, 1 cent from points in the Bainbridge and Riverton groups, and from Scranton and 2 cents from points in the Cedar Hollow and Trexlertown groups the rates above specified from group 3 to destinations in 60 and 67% territories, the rates found reasonable to be subject to carload minimum of 30,000 lb.

That the rates on agricultural or fluxing lime having no commercial value for building or chemical purposes from points of production thereof in the above groups to 60 and 67% territories should not exceed rates equivalent to 80% of the rates herein found reasonable on lime, n. o. s., from and to the same points.

That the rates assailed from the eastern points of origin to destinations west of 60 and 67% territories are, and for the future, will be unreasonable, to the extent that they exceed 27 cents from producing points in groups 1, 2 and 3, above named, to points in 100% territory, and rates to points in the other percentage territories in the states involved made the established percentages of the 27-cent or 100% rate; from the origin points east of groups 2 and 3 to the extent that they exceed rates on the basis of established differentials over the rates herein found reasonable from points in groups 1, 2 and 3, and from points in the Riverton group, to the extent that they exceed by more than 1 cent the rates herein found reasonable from points in groups 1, 2 and 3.

That the record is inadequate to enable the Commission to prescribe reasonable rates from the other Virginia groups above described.

That the rates assailed from the Ohio producing points are, and for the future will be unreasonable to the extent that they exceed, or may exceed, those which would result under the following scale, minimum 30,000 lb., subject to the observance of existing grouping of origin points and applied in the same manner and under the same formula for computing distances as that prescribed

for cement rates in Atlas Portland Cement Co. vs. C. B. & Q. R. R. Co., supra, as modified by the supplemental order of August 22, 1923, in that proceeding:

Distance scale	Rate cents
40 miles and over 25	9
55 miles and over 40	9.5
70 miles and over 55	10.0
85 miles and over 70	10.5
100 miles and over 85	11.0
120 miles and over 100	12.0
140 miles and over 120	12.5
160 miles and over 140	13.0
180 miles and over 160	13.5
200 miles and over 180	14.0
220 miles and over 200	14.5
240 miles and over 220	15.0
260 miles and over 240	15.5
280 miles and over 260	16.0
310 miles and over 280	16.5
340 miles and over 310	17.0
370 miles and over 340	17.5
400 miles and over 370	18.0
430 miles and over 400	18.5
460 miles and over 430	19.0
490 miles and over 460	19.5
520 miles and over 490	20.0
550 miles and over 520	20.5
580 miles and over 550	21.0
610 miles and over 680	21.5

The findings in the Mitchell and suspension cases should be modified to the extent that they are inconsistent with the conclusions herein proposed.—*Traffic World.*

Abramson and Body Lime Company to Start Production

F. E. WILSON, manager of the Abramson and Body Lime Co., Lindsay, Calif., has announced that the first unit of the plant recently constructed is about ready to start the production of lime. The plant, covered with corrugated iron, is on a spur connecting to the main line railroad. There is an excellent quality of limestone at their quarry, three miles east of the plant. The plant is equipped with two 140-ton kilns (rock capacity) and bunkers of 5-car capacity. It is planned to produce lump and pulverized lime for the present, but plans have been completed for the near future erection of a hydrating plant and probably ultimately the manufacture of white cement. With the ultimate erection of the other units the cost of the plant will be about $300,000.—*Lindsay (Calif.) Gazette.*

Missouri Lime Conference to Be Held at Carthage

AN all-day meeting to discuss application of lime to land will be held at the Drake hotel in Carthage, Mo. The conference will be attended by farmers, county agricultural agents, county secretaries of the Missouri Farmers' Association, and manufacturers of agricultural limestone. Representatives of twenty-one counties in southwest Missouri will report on the lime situation in their respective counties and place orders for carlot shipments.

The meeting at Carthage closes a campaign that has been held this summer for the purpose of interesting farmers in this section of Missouri in growing a larger acreage of legume crops, particularly clover and alfalfa. Experience has shown that it is profitable to lime the land to grow clover. It is a known fact that continuous grain cropping has reduced the fertility of much of the land in Missouri and if profitable grain yields are to be obtained in the future, a greater proportion of soil building legume crops must be grown, so liming is the first step in growing the soil improving crops.

Representatives to the conference will be asked to give the experiences in their counties in using lime to grow clover and alfalfa and other information will be told on the subject.

Following is the program of the meeting:

9:00 a. m.—Organization.

9:15 a. m.—Welcome address.

9:30 a. m.—The purpose of the meeting—R. J. Silkett, Missouri College of Agriculture.

10:00 a. m.—What Lime Means to Southwest Missouri Soils—P. F. Schowengerdt, Missouri College of Agriculture.

11:00 a. m.—A History of the Agricultural Limestone Industry—S. A. Fones, sales manager, Independent Gravel Company.

11:45 a. m.—Banquet—Drake hotel.

1:00 p. m.—Progress reports on county lime programs.

2:20 p. m.—Summary of Reports—P. F. Schowengerdt, soils department, Missouri College of Agriculture.

2:30 p. m.—Inspection of Carthage lime plants.—*Joplin (Mo.) Globe.*

New Cement Plants for Florida

THE Cuthbert Limestone Plants of Virginia and Georgia are planning the erection of a cement plant and crushing plant near Inverness, Fla. The preliminary surveys have already begun and construction is expected to start early in the fall. The plant will be connected to the new line being built by the Seaboard R. R. running to Tampa. The Peninsular Portland Cement Co., of Cement City, Mich., has also announced the erection of a plant in Tampa with raw materials to be obtained from Brookesville, Fla. It is expected that the two new industries will involve investments of several million dollars.—*Jacksonville (Fla.) Times-Union.*

More New Cement Plants in Prospect for Florida

INVESTIGATIONS relative to suitable sites for cement plants are now being conducted in Florida by several companies, according to reports.

The plant to be built at Tampa by the Cowham Engineering Co. will be the first in that state.

Several factors have deterred the building of cement plants in Florida to date, but it is now proving one of the most active markets in the country and it is likely that other cement plants will be planned.

Ideal Cement Company Rushes Erection of New Plant

THE Southern Pacific R. R. has begun work on the new line to run to the site of the Ideal Cement Co. plant near Ft. Collins, Colo., details of which were reported in the February 7 issue of ROCK PRODUCTS. It is reported that the contracts for the crushing machinery and kilns have already been let and the erection of the plant will be speedily begun. Architects are at work on the plans for office buildings and hotel to be erected at the plant.—*Colorado Springs (Colo.) Telegram.*

Charles Phillips New Superintendent of Alabama Portland Plant

CHARLES PHILLIPS has been named superintendent of the plant of the Alabama Portland Cement Co. at North Birmingham, which was formerly the Phoenix. Mr. Phillips, who was formerly assistant superintendent, succeeds R. J. Hawn, who resigned to become associated with Lindley C. Morton.

William Moeller, of Dallas, Texas, is the general superintendent of the Texas, Alabama and Virginia plants of the International System.

The new plant of the Virginia Portland Cement Co. at Norfolk will be placed in operation and have cement on the market some time in September, so it is stated. This company is also one of the International.

Idaho Marble Company Plant Destroyed by Fire

THE milling plant of the Idaho Marble Co., located near Lewiston, Idaho, was completely destroyed by fire of unknown origin. A. J. Warren, vice president and general manager of the company, stated that it might be possible to salvage some of the machinery. Recently the plant has been operating on a 24-hour basis and producing 120 tons of agricultural limestone, grits, marble dust for dusting mines and fine aggregate per day.

The company was organized about a year ago to develop the bedrock canyon limestone deposits. It is intended to start rebuilding at once. The loss was partly covered by insurance.—*Lewiston (Idaho) Tribune.*

Slag Shipped from Birmingham to Florida East Coast

THE Birmingham Slag Co. will furnish 24,000 tons of "Ensley" basic slag for a paving contract secured the latter part of July at West Palm Beach, Fla., by the Southern Roads Co., of Birmingham.

The recent West Palm Beach contract amounted to about 300,000 sq. yd. of Warrenite and sheet asphalt paving. It was divided between the Southern Roads Co., of Birmingham, the Andrews Asphalt Paving Co., and the Southern Material and Construction Co.

The Birmingham Slag Co. is also furnishing 13,000 tons of "Alabama City" basic slag to George W. Langford & Co., at Palm Beach, Fla., for a new $7,000,000 hotel.

Cement Products

TRADE MARK REGISTERED WITH U. S. PATENT OFFICE

Block Plant with Unusual System of Handling Its Product

Cinder Block Company of St. Louis Moves the Machines Instead of Moving the Blocks—Uses Gravity Conveyors for Placing in the Yard

THE plant of the Cinder Block Co. of St. Louis, which is at Olivette, a suburb of the city, is unusual in a number of respects, but especially in its method of handling the aggregates and the finished block. The basic idea of its system is that it is cheaper and quicker to move the machines than it is the blocks.

The plant is housed in a building 224 ft. long and 70 ft. wide. There are three regular block machines, two Anchor machines making 4-in. and 8-in. blocks and an Ideal machine making 12-in. blocks. These are automatic tampers. In addition there is a Multiplex machine for making 3-in. partition blocks, which is of the non-automatic type.

All these machines are set in timber frames that can be lifted from the floor by a lever so that casters may be slipped under each corner. The machine with its hopper, motor and everything else that is necessary for it to run is thus moved from one part of the room to another, and usually less than a minute's time is taken to make the change.

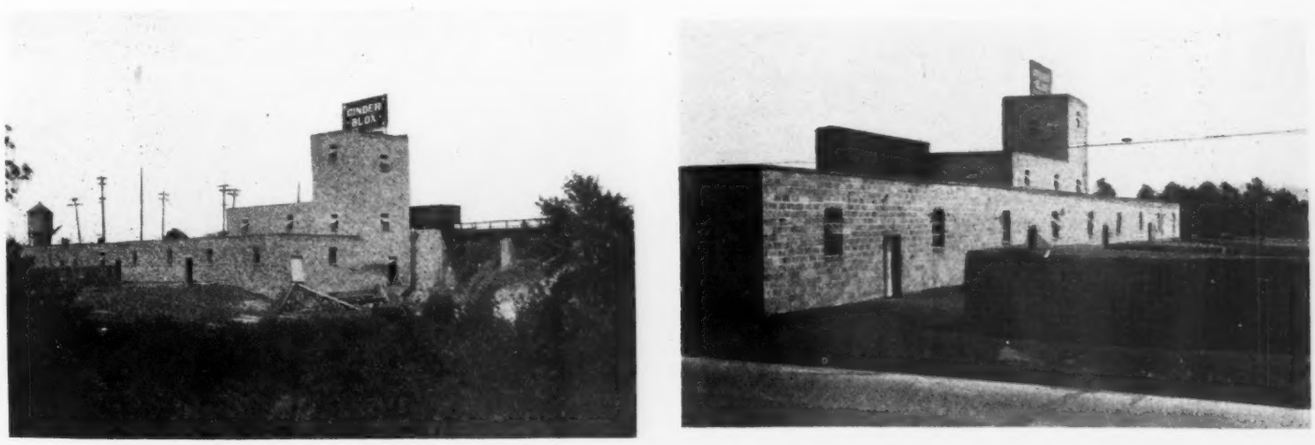
The blocks as they are made are not taken to a steam room but are cured in piles on the floor. When all the space near a machine is filled the machines are moved to make room for more blocks to be piled. After 36 hours in the building the blocks are moved out into the yard, where the curing is finished and this makes a space into which a machine is moved to start the piling again.

This makes a building free from the usual tracks and transfer trucks. Nor are trucks used in carrying the blocks to the yard. This work is done by simple gravity conveyors, long "ladders" of rolls along which the blocks move easily to their destination in the yard.

Whether this is better or not than the usual trucking system is a question for the reader to decide. There is no question but what this particular company likes it, for they tried it out in their Kansas City plant which was built last year and continued its use in the St. Louis plant which began operations about July 1 of this year.

It was necessary to pay especial attention to details in adopting this plan. The casters for moving the machines are built especially for the work and have roller bearings. The gravity conveyors are also specially made. The rollers are all of seamless cold drawn steel tubing, which is the only roller that has been found to stand up to the work, and every roller is on ball bearings so that the blocks will roll when the conveyor is set on a flat angle.

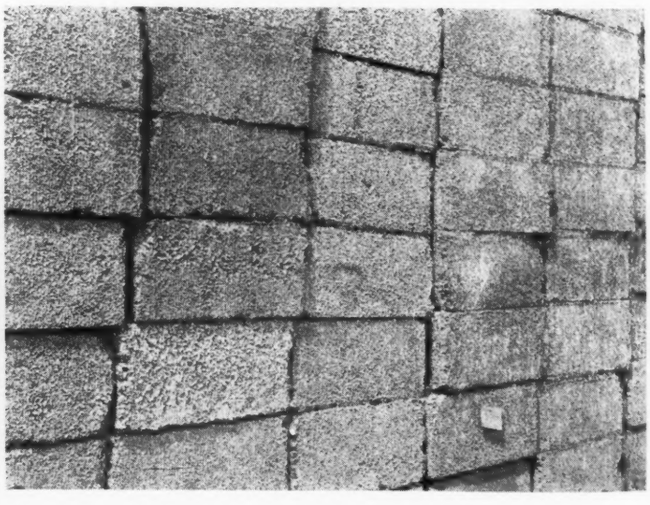
Cinders are used as aggregate, the plant being licensed under the Straub patents. Only cinders from coal fired by automatic stokers are used, containing about 10% of unburned carbon. The cinders are received in hopper bottomed cars and dumped into a hopper from which they go to the boot of an elevator. This lifts



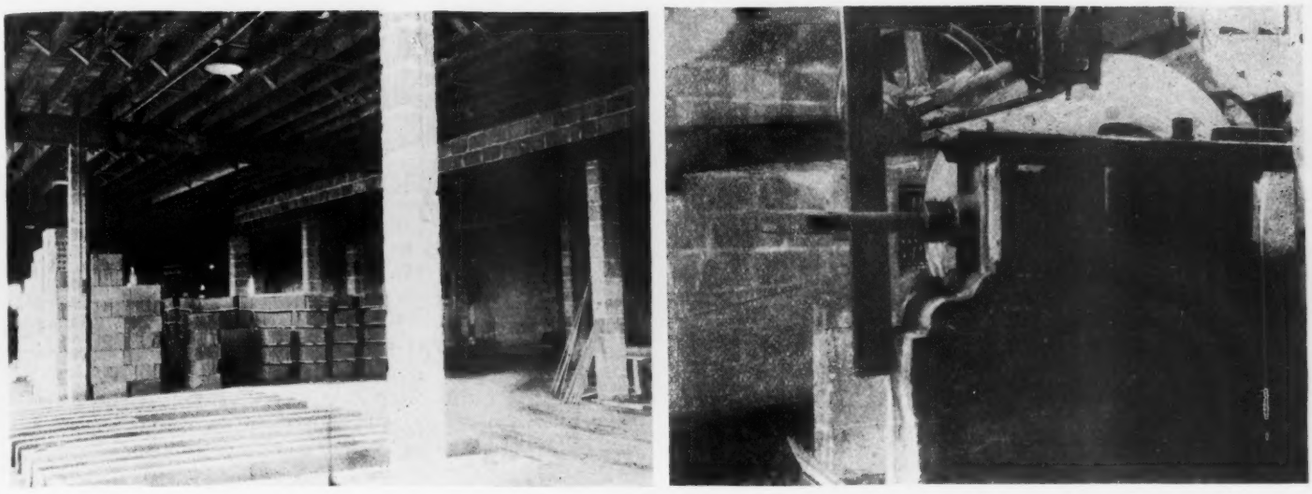
Left—End of plant showing car moving over hopper and screening tower. Right—Side view of plant and storage yard. The building was put up of blocks made at the Kansas City plant of this company

Left—Gravity conveyor on which blocks are brought from the building to the yard. Right—Another view of the conveyor showing the low inclination on which the blocks will travel

Left—End of plant showing conveyor for bringing out lintels. Right—The cars run over the roof of the building after being unloaded at the plant hopper



Left—Cast lintels which are hand molded. Each contains three reinforcing rods. Right—Showing texture of block which affords an excellent attachment for stucco. All blocks are dated as they are placed in the yard. The date for this lot is on the tag at the lower right hand corner



Left—Interior of Building. The columns supporting the roof are of blocks placed one above the other. Right—Rolls which are used for crushing cinders for aggregate

them to a rotary screen 10 ft. long and 36 in. in diameter which has 11/16-in. square mesh openings. The screen was made by the company.

The oversize of this screen goes to a pair of Cornish type rolls, 42 in. in diameter with faces 14 in. wide. An elevator takes the product of the rolls and sends it to the screen so that only those pieces which have passed the screen go to the aggregate bin.

From this bin the cinders are drawn to a measuring hopper containing 12 cu. ft. With two sacks of cement this makes a 14 ft. charge for one of the two Besser mixers. The cinders are dropped into the mixer by a swinging chute which is then swung over to the other mixer for the next charge. A 2-min. dry mix is given and then water is added all at once from a trough above the mixer and 2-min. wet mix is given. The charge is held in the mixer until a bell rings which tells the mixer man that a buggy is below to receive the charge when he dumps the mixer into a chute.

The buggies which hold 14 ft. have high wheels so that the charge may be dumped into the hopper of the block machine. Of course they have to be pushed a variable distance according to the position of the machine, which is moved according to the system explained above.

Lintels to go above doors and windows are another product of the plant. These are made by hand, being tamped in a mold made of two channel irons with adjustable end pieces. They have each three reinforcing rods and the top side of each is marked so that they will go in the right position in the building.

An interesting feature of this plant is the construction of the building which houses it. The floor is of gravel concrete, the sides of cinder blocks, made at the Kansas City plant, and the roof of wood. This roof is upheld by columns made of 8x8 blocks set one upon another. It is figured that this is almost as strong as a column of solid cinder concrete would be.

The main office of the Cinder Block Co. is in Kansas City, Mo. Paul M. Fogel is president of the company, H. H. Crowell is vice-president and general manager, E. W. Arrasmith is vice-president and Lyle L. Fogel is secretary. The company operates a number of plants in Arkansas, Oklahoma, Kansas, Missouri, Nebraska, Colorado, Minnesota and Iowa and is building others.

Longview Concrete Company

ALTHOUGH in business for only 2½ years the Longview Concrete Pipe Co., Longview, Wash., has achieved remarkable success. Originally started to manufacture concrete pipe, it has added stone tile, made by the wet mix method, along with the production of sand and gravel. The plant situated on an 8-acre site, consists of factory buildings, curing and storage sheds and wharf. All modern electrical equipment is used. The plant represents an investment of about $90,000.—*Longview (Wash.) News.*

Hoover Building Code Committee on Concrete Units

THE report of the building code committee of the United States Bureau of Standards in the "Elimination of Waste" series has been published under the title "Recommended Minimum Requirements for Masonry Wall Construction," and the following paragraph shows what the trend is as far as concrete masonry units are concerned:

"Concrete Block or Concrete Tile—The average compressive strength of concrete block or tile used for exterior or party walls or piers shall not be less than 700 lb. per sq. in. of gross sectional area tested in position as used in the wall. The absorption of concrete block or tile shall not exceed 10% under a 24-hour immersion test, except that where concrete block or tile have an average compressive strength of over 1200 lb. per sq. in. gross area, or where they are not exposed to dampness, or where they are coated with stucco, the requirement as to absorption may be waived. For block or tile made of concrete weighing less than 140 lb. per cu. ft., the average absorption in per cent by weight shall be not more than 10 multiplied by 140 and divided by the unit weight in pounds per cubic foot of the concrete under consideration."

A $150,000 Cement Products Plant in Dallas, Texas

ERECTION of a Dallas, Texas, plant of the Sherman Concrete Products Co. of Little Rock, Ark., has started on a five-acre tract south of Hudnall on the main line of the Missouri-Kansas-Texas Ry.

Five concrete kilns, an office building and a frame shed are being erected on the plant site. Two tracks are being laid in the property, providing connections with the railroad. Although headquarters of the concern are maintained in Little Rock, distribution of concrete sewer, drainage and culvert pipes will be made from the Dallas plant after its opening about August 1.

"The new plant, which will represent an investment of about $150,000 when completed, forms a distinct addition to the industrial life of the city," Mr. Peeler, industrial manager of the M.-K.-T. R.R., said. "The concern is one of the largest engaged in this sort of manufacturing and it maintains branches in several southern cities."

A. N. Sherman of New Orleans, La., is president of the concern and R. S. Lander of Little Rock is secretary-treasurer. Mr. Lander will spend most of his time in Dallas when the plant is completed. Its capacity will be four carloads of the products daily.—*Dallas (Texas) Journal.*

Traffic and Transportation

By EDWIN BROOKER, Consulting Transportation and Traffic Expert
Munsey Building, Washington, D. C.

Proposed Changes in Rates

THE following are the latest proposed changes in freight rates up to the week beginning August 17:

Central Freight Association Docket

11310. Crushed stone. Fultonham, Ohio, to Blue Creek, W. Va. Present rate, $2.45 per net ton; proposed, $1.75 per net ton.

11311. Slag. Columbus, East Columbus and South Columbus, Ohio, to Blue Creek, W. Va. Present rate, $2.45 per net ton; proposed, $1.75 per net ton.

11312. Gravel and sand other than blast, engine, foundry, glass, molding or silica. East Liverpool, Ohio, to Hubbard, Ohio. Present rate, 13½ cents; proposed, $1.05 per ton of 2000 lb.

11316. Sand (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing loam, molding or silica) and gravel. Winona Lake, Ind., to Leeland, Ind. Present rate, 12 cents; proposed, $1.04 per net ton.

11322. Core sand. Juniata, Mich., to Indiana points. Present, sixth class; proposed, $2.27 to Ft. Wayne, Kendalville and Auburn, Ind.; $2.52 to Muncie and Marion, Ind.; $2.76 to Anderson, Richmond, Cambridge City and Newcastle, Ind., and $3.02 per net ton to Indianapolis, Ind.

11324. Cement. Painesville, Ohio, to points taking Grafton or Fairmont, W. Va., basis. Present rate, 22 cents; proposed, 17 cents.

11326. Sand (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica) and gravel. Massillon, Ohio, to Lorain and Rocky River, Ohio. Present rate, 90 cents per 2000 lb. to Lorain, Ohio, and 14 cents to Rocky River, Ohio. Proposed, 80 cents per 2000 lb.

11330. Crushed stone. Holland, Ohio, to Cleveland, Wickliffe, Willoughby, Painesville, Ashtabula and Conneaut, Ohio. Present rates, $1.20 to Cleveland, $1.60 to Wickliffe, Willoughby, Painesville, Ashtabula and Conneaut, Ohio. Proposed, 90 cents to Cleveland, Ohio; $1.20 to Wickliffe, Willoughby, Ashtabula and Painesville, Ohio, and $1.40 per net ton to Conneaut, Ohio.

11331. Crushed stone. Piqua, Ohio, to Lynn and Crete, Ind., Glen Karn, Clark, Hewitt, Springfield, Brooks, Plattsburg, Kay's Switch, London, Versailles, Elroy, DeGraff, Bellefontaine and Sharonville, Ohio. Cents per net ton (except as noted) from Piqua, Ohio, to C. C. C. & St. L. Ry. stations:

	Proposed	Present
Lynn, Ind.	92	13*
Crete, Ind.	92	13*
Glen Karn, Ohio	80	13*
Clark, Ohio	80	13*
Hewitt, Ohio	80	13*
Springfield, Ohio	70	90
Brooks, Ohio	80	13*
Plattsburg, Ohio	80	13*
Kay's Switch, Ohio	80	13*
London, Ohio	90	100
Versailles, Ohio	80	90
Elroy, Ohio	80	126
Bellefontaine, Ohio	80	11½*
Sharonville, Ohio	80	90

*In cents per 100 lb. (sixth class rate).

11332. Stone, crushed. Holland, Ohio, to Butler, Ind. Present rate, 88 cents per ton of 2000 lb.; proposed, 86 cents per ton of 2000 lb.

11333. Stone, crushed. Holland, Ohio, to Elkhart, Ind. Present rate, $1.13 per ton of 2000 lb.; proposed, $1.01 per ton of 2000 lb.

11334. Cement. Universal, Penn., to Yatesboro, Penn. Present rate, 17½ cents; proposed, 14½ cents.

11351. To establish a rate of $1.10 per net ton on sand (except blast, core, engine, filter, fire or furnace, foundry grinding or polishing, loam, molding or silica) and gravel. Carloads, minimum weight 90% of marked capacity of car, except when car is loaded to full cubical or visible capacity actual weight will apply, from Ft. Jefferson, Ohio, to Delta, Ohio. Present rate, sixth class, 18½ cents per 100 lb.

11346. To establish the Joliet combination of $4.16 per net ton on sand, all kinds, Ottawa, Ill., District to Buffalo, N. Y., and points taking same rates. Present rate, $3.53 per net ton.

11356. Sand and gravel. Pleasant Lake, Ind., to Payne, Ohio. Present rate, $1.13 per ton of 2000 lb.; proposed, 90 cents per ton of 2000 lb.

11357. Gravel and sand (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica). Marion, Ohio, to West Salem, Ohio. Present rate, $1.10 per ton of 2000 lb.; proposed, 90 cents per ton of 2000 lb.

11368. Sand (except blast, core, engine, foundry, filter, fire or furnace, grinding or polishing, loam). Charleston, W. Va., to Belle, W. Va. Present rates, 80 cents per net ton; proposed, 70 cents per net ton.

11369. Crushed stone. Melvin, Ohio, to Aurora and Lawrenceburg, Ind. Present rate, $1.27 per net ton; proposed, $1 per net ton.

11371. Sand (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica) and gravel. Akron and Copley, Ohio, and points in the Akron and Copley District (see note) to Ashtabula, Ohio. Present rate, $1.40 per net ton; proposed, $1.10 per net ton.

Southern Freight Association Docket

22134. Sand. Carloads, minimum weight 90% of marked capacity of car, except when cars are loaded to their visible capacity, actual weight will govern from White Oak, Tenn., to Milan, Tenn. Present rate, $1.40 per net ton; proposed, $1 per net ton.

22155. Sand or gravel. Carloads, minimum weight 90% of marked capacity, except where cars are loaded to their visible capacity, actual weight will govern, from and to points named below. Present and proposed rates are:

In cents per net ton to Geneva, Ala.:

From	Present Sand	Present Gravel	Proposed Sand and gravel
Jackson's Lake, Ala.	136⅔	140	131
Prattville Jct., Ala.	136⅔	140	131
Oktamulke, Ala.	136⅔	140	131
Coodada, Ala.	136⅔	140	131
Montgomery, Ala.	126	140	126

In cents per net ton to Opp, Alabama:

From	Present Sand	Present Gravel	Proposed Sand and gravel
Jackson's Lake, Ala.	117	140	117
Prattville Jct., Ala.	117	140	117
Oktamulke, Ala.	117	140	117
Coodada, Ala.	117	140	117
Montgomery, Ala.	113	130	113

Proposed rates are made on basis of the proposed Alabama-Georgia scale.

22169. Cement. Carloads, usual description and carloads minimum weight, from Clinchfield, Ga., to Nitrolee, Great Falls and Georgetown, S. C. Combination rates now apply. Proposed, 23 cents per 100 lb., made in line with rates to other points in South Carolina.

South Western Freight Bureau Docket

5622. Chatts. From points in Oklahoma to points in Arkansas, Louisiana, Missouri, etc. To amend S. W. L. Tariff 114A so as to permit the use of mileage scale on chatts, carloads, minimum weight 80,000 lb.

Kansas Gas-Belt Cement Rates

IN a report on No. 15117, Iola Cement Mills Traffic Associatoin et al. vs. Atchison, Topeka & Santa Fe et al., and No. 15138, Atlas Portland Cement Co. of Kansas vs. Same, Examiner John T. Money advised the commission to find rates on cement from the Kansas Gas Belt to points in the Kansas City, Mo.-Kans., switching district, except points on the Kansas City Railway between Dodson and Westport, Mo., not unreasonable but unduly prejudicial to manufacturers of cement in the Kansas Gas Belt and unduly preferential of manufacturers at Cement City (Sugar Creek, Mo.), Bonner Springs and Sunflower, Kans., to Kansas City, Mo.-Kans. He said the commission should find rates on cement from the gas belt to points on the Kansas City Railways between Dodson and Westport unreasonable.

The finding in more detail is that the circumstances and conditions surrounding the transportation of cement from the points in the Kansas Gas Belt, from Bonner Springs and Sunflower and from Cement City to the combined Kansas City switching district are substantially similar, and that rates on cement from the gas belt, including Independence, to points in the combined switching district, as defined in the tariffs of the delivering lines, except points on the Kansas City Railways between Dodson and Westport, are unduly prejudicial to the gas belt points and shippers therefrom and unduly preferential to Bonner Springs, Sunflower, Cement City and shippers therefrom. The examiner said the commission should further find that the establishment of rates on cement from Bonner Springs, Sunflower and Cement City to all points within the combined switching district should be on the basis of 6.5 cents and the contemporaneous maintenance of rates of 11 cents from the Gas Belt would remove the undue prejudice. The commission should further find, he said, that the rates to points on the Kansas City Railways between Dodson and Westport from the Kansas Gas Belt were unreasonable, and should not exceed 11 cents from the Kansas Gas Belt.

These findings, Examiner Money said, should be without prejudice to any finding which might be made in No. 14801, Missouri Portland Cement Co. vs. Atchison, Topeka & Santa Fe et al., and related cases now pending in which the groupings of the Kansas Gas Belt mills was under attack. He said the order dated October 9, 1923, in cement from Bonner Springs, 83 I. C. C. 176, should be vacated.—*Traffic World.*

Houston Adjustment of Rates

FREIGHT rates on sand and gravel for a period of nine months are to be governed by the mileage to the Southern Pacific or the San Antonio and Arkansas Pass freight depot, whichever is the cheaper, under an agreement reached before the railroad commission recently.

The agreement was reached between representatives of the Southern Pacific Railway and the chamber of commerce when the latter protested the increased freight costs that would come about through a difference of 3.6 miles in distance between the Southern Pacific and the Sap depots.—*Houston (Texas) Chronicle.*

Governor Groesbeck Plans to Force State Purchase of Cement Plant

ACCORDING to a despatch from the *Detroit Free Press,* Governor Groesbeck's plan to have the state buy the Chelsea cement plant, under the $500,000 option contract, is to be carried out within the next two years without the legislature having a word to say about it.

This is made clear in developments of the last week in which the governor announces new expenditures for the plant, and optimistically explains that it will show a big enough profit for the state in the next two years to provide the purchase price. The governor does not explain what the state is to do with the cement plant it will acquire through the legislative office after its highway work in southern Michigan is completed. In fact he frankly admits that this matter perplexes him. Although there is already enough market for the state's cement on its various construction projects in the southern part of the state, the time will soon come when deliveries will not be practical.

Delivery Limited

It is conceded that 120 miles is about the greatest shipping distance from the mill at which a satisfactory profit can be shown. The new prison at Jackson is caring for much of its output at the present time, but the day is not far distant when it and the highway network will be completed.

Of this the governor says:

"When the time comes the state would lease the plant to private parties or sell it. One thing is certain, the state will be out nothing, for we will soon have it paid for out of its earnings and it will cost the taxpayers not a cent. If we do decide to sell we can at least make a profit equal to our original investment, and the state will be that much ahead."

The administration's plan for immediately improving the plant include the increasing of its capacity to 800,000 bbl. a year, and providing additional storage space in its warehouses for 80,000 bbl. This will bring its total warehouse capacity up to 200,000 bbl. and will permit operation of the plant practically all the year around. The surplus produced last winter has nearly all been used up on the state highways and prison construction already this year and the improvements, it is expected, will make it possible for the plant to produce practically half the cement which is used on state highways in 1926.

Rental $75,000 Yearly

The original agreement under which the state took over the Chelsea plant was that it would pay $75,000 a year rental for three years, and that it would then have the option of buying the plant for $500,000, the rental paid to apply on the purchase price. The plan now is to pay up the full $500,000 in the next two years, the rental agreement having been changed to a straight purchase proposition on terms of $75,000 a year.

The plant is now making a net profit of 36 cents on every barrel of cement, according to L. R. Griffiths, its superintendent, who has done the backbone of the work by bringing it back into the profit-making class. The cement is being supplied state projects at prices equivalent to lowest market price.

High costs of keeping the machinery in first class operating condition has made it necessary to charge 22 cents a barrel for machinery depreciation. No charge is at present being made for the estimated 5% depreciation on the buildings and general equipment.

The 161 prisoners from Jackson who are working at the plant are paid from 40 cents to $1.30 a day out of the plant's earnings. The salaries of 31 guards and 31 foremen also are charged to the industry. Cost of food and clothing is charged to the prison.

The matter of acquiring the plant has been taken care of by the executive office, but the matter of disposing of it is to fall on the shoulders of some future legislature.

National Safety Council Meeting, September 28 to October 2

THE National Safety Council will hold its Fourteenth Annual Safety Congress in Cleveland, Ohio, September 28 to October 2. The cement section, of which Henry A. Reninger of the Lehigh Portland Cement Co., Allentown, Penn., is chairman and H. G. Jacobsen of the Portland Cement Association, Chicago, is secretary, will hold its meeting at the Cleveland hotel, September 29, at 10 o'clock. The quarry section, of which E. E. Evans of the Whitehouse Stone Co., Toledo, Ohio, is chairman and D. C. Souder of the France Stone Co., Toledo, is secretary, will hold its meeting at the same hotel at 10 o'clock October 1. A joint meeting of the cement and quarry sections will be held at Hotel Cleveland at 10 o'clock September 30. The headquarters of the association will be at Hotel Statler, Cleveland. This meeting will discuss safety in the use of high explosives. The quarry meeting will have papers on the hazards of standard and narrow gage railroad equipment and on safety in quarries and crushing plants.

Plaster Board Rates

THE Interstate Commerce Commission, in a report on I. and S. No. 2406, classification exceptions on plaster board, etc., to Canada (mimeographed), found the proposed cancellation of exceptions to official classification ratings on calcined and wall plaster, gypsum rock and plaster board from Grand Rapids and other points in central territory to destinations in Canada not justified. It has ordered the suspended schedules cancelled and discontinued the proceedings. The proposal was to cancel the application of a present rating of 83.33 per cent of sixth class published in item 1970 of exceptions to official classification, Jones' I. C. C. 1594, leaving full sixth class applicable.

Gypsum Mined and Shipped in 1924

THE QUANTITY of gypsum mined in 1924 was 5,042,629 short tons, an increase of 289,181 tons, or 6%, over 1923, according to a statement made public by the Bureau of Mines, Department of Commerce. The value of sales of both crude and calcined gypsum was $42,724,507, an increase of $7,836,352, or 22%; 3,568,569 tons was sold calcined and 982,108 tons in crude form, chiefly for use in portland cement but including 22,298 tons sold as agricultural gypsum. The figures are based on reports submitted by 72 operators of gypsum mines to the Mineral Resources Division of the United States Geological Survey before the transfer of that division to the Bureau of Mines of the Department of Commerce.

GYPSUM PRODUCED AND SOLD IN THE UNITED STATES, 1924, BY STATES

State	Number of active plants reporting	Total quantity mined (short tons)	Sold without calcining — Short tons	Sold without calcining — Value	Sold calcined — Short tons	Sold calcined — Value	Total value
Iowa	6	727,385	150,450	$ 375,155	489,745	$ 5,277,910	$ 5,657,339
Kansas	3	141,908	47,509	116,681	77,796	777,512	894,262
Michigan	8	577,526	124,134	324,140	453,135	5,626,682	5,950,822
Nevada	6	365,714	(*)	(*)	278,467	2,001,130	2,063,089
New York	13	1,474,491	335,841	982,777	1,019,319	13,346,469	14,329,246
Ohio	4	525,466	17,757	49,579	477,845	5,563,913	5,620,099
Oklahoma	5	316,134	64,980	157,748	201,762	2,442,333	2,600,081
Texas	7	402,245	32,233	62,314	301,512	2,566,736	2,629,110
Utah	4	90,221	34,793	41,104	43,590	292,253	335,588
Wyoming	3	32,715	(*)	(*)	25,095	189,871	190,344
Other States†	13	388,805	174,411‡	564,822‡	200,303	1,965,378	2,454,527
Total	72	5,042,629	982,108	$2,674,320	3,568,569	$40,050,187	$42,724,507

*Included under "Other States."
†Arizona, California, Colorado, Montana, New Mexico, Oregon, South Dakota and Virginia.
‡This figure includes also output of states entered as "(*)" above.

The Rock Products Market

Wholesale Prices of Crushed Stone

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Buffalo, N. Y.	1.30	1.30	1.30	1.30	1.30	1.30
Chaumont, N. Y.	1.00	.....	1.75	1.50	1.50	1.50
Eastern Pennsylvania	1.35	1.35	1.35	1.35	1.35	1.35
Munns, N. Y.	1.00	1.40	1.40	1.30	1.30	.....
Northern New Jersey	1.60	1.50@1.80	1.80@2.00	1.40@1.60	1.40@1.60	.....
Prospect, N. Y.	1.00	1.40	1.40	1.30	1.30	.....
Walford, Penn.	1.00	1.30	.....	1.50h	1.50h	.....
Watertown, N. Y.	.50	.....	1.75	1.50	1.50	1.50
Western New York	.85	1.25	1.25	1.25	1.25	1.25
CENTRAL						
Alton, Ill.	1.85	.....	1.85	1.50	.....	.....
Bloomville, Middlepoint, Dunkirk, Bellevue, Waterville, No. Baltimore, Holland, Kenton, New Paris, Ohio; Monroe, Mich.; Huntington, Bluffton, Ind.	1.00	1.10	1.10	1.00	1.00	1.00
Buffalo and Linwood, Iowa	1.00	.....	1.15	.95	1.00	1.00
Chicago, Ill.	.80	1.00	1.00	1.00	1.00	1.00
Columbia, Krause, Valmeyer, Ill.	1.00@1.75	1.20	1.20	1.20	1.20	1.40
			Flux all at 1.30			
Cypress, Ill.	1.25	1.15	1.10	1.10	1.10	1.10
Dundas, Ont.	.70	.90	.90	.90	.90	.90
Gary, Ill.	1.00	1.37½	1.37½	1.37½	1.37½	1.37½
Greencastle, Ind.	1.25	1.25	1.15	1.05	.95	.95
Lannon, Wis.	.80	1.05	1.05	.95	.95	.95
Northern New Jersey	1.30	.....	1.80	1.60	1.40	.....
River Rouge, Mich.	1.00	1.10	1.10	1.10	1.10	1.10
Sheboygan, Wis.	1.10	1.10	1.10	1.10	1.10	1.10
St. Vincent de Paul, Que.	.85	1.35	1.05	.95	.90	.90
Stone City, Iowa	.75	.....	1.20	1.10	.....	.....
Toronto, Ont.	1.60	1.95	1.80	1.80	1.80	1.80
Waukesha, Wis.	.90	.90	.90	.90	.90	.....
Wisconsin Points	.50	.....	1.00@1.15	.90@1.05	.90@1.05	.....
SOUTHERN:						
Alderson, W. Va.	.60	1.60	1.60	1.50	1.40	.....
Cartersville, Ga.	1.50	1.50	1.50	1.15	1.15	.....
Chico, Texas	1.00	1.40	1.35	1.25	1.20	1.10
El Paso, Texas	1.00	1.00	1.00	1.00	.....	.....
Ft. Springs, W. Va.	.60	1.60	1.60	1.50	1.40	.....
Graystone, Ala.			Crusher run fluxing stone, 1.00 per net ton			
Olive Hill, Ky.	.50@1.00‡	1.00	1.00	1.00	1.00	1.00
Rockwood, Ala.	.90	.....	.....	.....	1.00	.90
Rocky Point, Va.	.50@1.00	1.40@1.60	1.30@1.40	1.15@1.35	1.10@1.20	1.00@1.05
WESTERN:						
Atchison, Kans.	.25	2.00	2.00	2.00	2.00	1.60‖@1.80
Blue Spr'gs & Wymore, Neb.	.20	1.45	1.45'	1.35c	1.25d	1.20
Cape Girardeau, Mo.	1.25	.....	1.25	1.25	1.10	.....
Kansas City, Mo.	1.00	1.80	1.80	1.80	1.80	1.80
Rock Hill, St. Louis Co., Mo.	1.25	1.35	1.35	1.35	1.35	1.25

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Branford, Conn.	.60	1.70	1.45	1.20	1.05	.....
Duluth, Minn.	.90	2.25	1.90	1.50	1.35	1.35
Dwight, Calif.	1.75	1.75	1.75	1.75	1.75	.....
Eastern Maryland	1.00	1.60	1.60	1.50	1.35	1.35
Eastern Massachusetts	.85	1.75	1.75	1.25	1.25	1.25
Eastern New York	.75	1.25	1.25	1.25	1.25	1.25
Eastern Pennsylvania	1.10	1.70	1.60	1.50	1.35	1.35
New Haven, New Britain, Meriden & Wallingford, Conn.	.80	1.70	1.45	1.20	1.05	1.05
Northern New Jersey	1.50e	2.00	1.80	1.40	1.40	.....
Oakland and El Cerritto, Calif.	1.00	1.00	1.00	.90	.90	.....
San Diego, Calif.	.70e	1.80f	1.60	1.40g	1.30	.....
Sheboygan, Wis.	1.00	1.10	1.10	1.10	1.10	.....
Springfield, N. J.	2.00	2.10	2.10	1.70	1.70	1.70
Westfield, Mass.	.60	1.50	1.35	1.20	1.10	1.10

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Berlin, Utley and Red Granite, Wis.—Granite	1.50	1.60	1.35	1.25	1.25	1.00
Coldwater, N. Y.—Dolomite			1.50 all sizes			
Columbia, S. C.—Granite	.50	1.75	1.75	.....	1.60	.....
Eastern Penn.—Sandstone	1.35	1.70	1.65	1.40	1.40	1.40
Eastern Penn.—Quartzite	1.20	1.35	1.25	1.20	1.20	1.20
Lithonia, Ga.	.75	1.75	1.60	1.25	1.25	.....
Lohrville, Wis.—Granite	1.65	1.70	1.65	1.45	1.50	.....
Middlebrook, Mo.—Granite	3.00@3.50	.....	2.00@2.25	2.00@2.25	.....	1.25@2.00
Northern New Jersey (Basalt)	150	2.00	1.80	1.40	1.40	.....
Richmond, Calif. (Basalt)	.75*	.....	1.50*	1.50*	1.50*	.....

*Cubic yd. †1 in. and less. ‡Two grades. ‖Rip rap per ton. (a) Sand. (b) to ¼ in. (c) 1 in., 1.40. (d) 2 in., 1.30. (e) Dust. (f) ¼-in. (h) less 10c discount. (i) 1-in., 1.40.

Agricultural Limestone

(Pulverized)

Alton, Ill.—Analysis 99% $CaCO_3$, 0.3% $MgCO_3$; 90% thru 100 mesh..	6.00
50% thru 4 mesh	3.00
Asheville, N. C.—Analysis, 57% $CaCO_3$, 39% $MgCO_3$; 50% thru 100 mesh; 200-lb. burlap bag, 4.00; bulk	2.75
Branchton and Osborne, Penn.—100% thru 20 mesh; 60% thru 100 mesh; 45% thru 200 mesh. (Less 50 cents commission to dealers)	5.00
Cape Girardeau, Mo.—Analysis, 93% $CaCO_3$, 3.5% $MgCO_3$; pulverized; 90% thru 50 mesh	1.50
Cartersville, Ga.—Analysis 68% $CaCO_3$, 32% $MgCO_3$; pulverized	3.00
50% thru 50 mesh	1.50
Chaumont, N. Y.—Pulverized limestone, bags, 4.00; bulk	2.50
Chico, Texas—90% thru 100 mesh	4.50
50% thru 100 mesh	3.50
90% thru 50 mesh	3.00
50% thru 50 mesh	2.50
90% thru 4 mesh	1.50
50% thru 4 mesh	1.25
Colton, Calif.—Analysis, 95% $CaCO_3$, 3% $MgCO_3$—all thru 20 mesh—bulk	4.00
Danbury, Conn., Rockdale and West Stockbridge, Mass.—Analysis, 90% $CaCO_3$, 5% $MgCO_3$; 50% thru 100 mesh; paper bags, 4.75; cloth, 5.25; bulk	3.25
Dundas, Ont., Can.—Analysis, 53.80% $CaCO_3$, 43.31% $MgCO_3$; 35% thru 100 mesh, 50% thru 50 mesh, 100% thru 10 mesh; bags, 4.75; bulk	3.00
Hillsville, Penn.—Analysis, 94% $CaCO_3$, 1.40% $MgCO_3$, 75% thru 100 mesh; sacked	5.00
Jamesville, N. Y.—Analysis, 89.25% $CaCO_3$; 5.25% $MgCO_3$; pulverized, bags, 4.00; bulk	2.50
Knoxville, Tenn.—Analysis, 52% $CaCO_3$, 37% $MgCO_3$; 80% thru 100 mesh; bags, 3.95; bulk	2.70
Linville Falls, N. C.—Analysis, 57% $CaCO_3$, 39% $MgCO_3$; 50% thru 100 mesh; 200-lb. burlap bag, 4.00; bulk	2.75
Marblehead, Ohio—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$; 60% thru 100 mesh; 70% thru 50 mesh; 100% thru 10 mesh; 80 lb. paper sacks, 5.10; bulk	3.60
Marion, Va.—Analysis, 90% $CaCO_3$, guaranteed; 42.5% thru 100 mesh, 11.3% thru 80, 20.2% thru 60, 22.8% thru 40, 3.2% thru 20 and under or 75% thru 40 mesh; pulverized, per ton	2.00
Mayville, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 90% thru 100 mesh	3.90@ 4.50
Mountville, Va.—Analysis 76.60% $CaCO_3$, 22.83% $MgCO_3$; 50% thru 100 mesh, 100% thru 20 mesh—125-lb. hemp bags	5.00
Piqua, Ohio—Total neutralizing power 95.3%; 99% thru 10, 60% thru 50; 50% thru 100	2.50@ 2.75
100% thru 10, 90% thru 50, 80% thru 100; bags, 5.10; bulk	3.60
99% thru 100, 85% thru 200; bags, 7.00; bulk	5.50
Rocky Point, Va.—Analysis, 95% $CaCO_3$; 50% thru 200 mesh	1.75@ 2.00
Asphalt filler dust, 80% thru 200 mesh	3.00@ 3.50
Waukesha, Wis.—90% thru 100 mesh	3.70
Watertown, N. Y.—Analysis 96-99% $CaCO_3$; 50% thru 100 mesh; bags, 4.00; bulk	2.50
West Stockbridge, Mass.—Pulverized; paper bags, 4.10; cloth, 4.60; bulk	2.85

Agricultural Limestone

(Crushed)

Alderson, W. Va.—Analysis, 90% $CaCO_3$; 90% thru 50 mesh	1.50
Atlas, Ky.—Analysis over 90% $CaCO_3$; 90% thru 4 mesh	1.00@ 2.00
Bedford, Ind.—Analysis, 98.5% $CaCO_3$, 0.5% $MgCO_3$; 90% thru 10 mesh	1.50
Bettendorf, Iowa—97% $CaCO_3$, 2% $MgCO_3$; 50% thru 100 mesh; 50% thru 4 mesh	1.50
Blackwater, Mo.—Analysis, 99% $CaCO_3$; 100% thru 4 mesh	.60
Bridgeport and Chico, Texas—Analysis, 94% $CaCO_3$, 2% $MgCO_3$; 100% thru 10 mesh	1.75
50% thru 4 mesh	1.50

(Continued on next page)

Agricultural Limestone

(Continued from preceding page)

Chicago, Ill.—50% thru 100 mesh; 90% thru 4 mesh	.80
Columbia, Krause, Valmeyer, Ill.—Analysis, 90% $CaCO_3$; 90% thru 4 mesh	1.35
Cypress, Ill.—90% thru 100 mesh..... 50% thru 100 mesh, 90% thru 50 mesh, 50% thru 50 mesh, 90% thru 4 mesh, 50% thru 4 mesh	1.25 1.15
Ft. Springs, W. Va.—Analysis, 90% $CaCO_3$; 90% thru 50 mesh	1.50
Garrett, Okla.—All sizes	1.25
Gary, Ill.—Analysis, approx. 60% $CaCO_3$, 40% $MgCO_3$; 90% thru 4 mesh	.60
Kansas City, Mo.—50% thru 100 mesh	1.25
Lannon, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 99% through 10 mesh; 46% through 60 mesh	2.00
Screenings (¼ in. to dust)	1.00
Marblehead, Ohio.—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$, 32% thru 100 mesh; 51% thru 50 mesh; 83% thru 10 mesh; 100% thru 4 mesh (meal) bulk	1.60
Mayville, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 50% thru 50 mesh	1.85@ 2.35
Middlepoint, Bellevue, Kenton, Ohio; Monroe, Mich.; Huntington and Bluffton, Ind. — Analysis, 42% $CaCO_3$, 54% $MgCO_3$; meal, 25 to 45% thru 100 mesh	1.60
Milltown, Ind. — Analysis, 94.41% $CaCO_3$, 2.95% $MgCO_3$; 30.8% thru 100 mesh, 38% thru 50 mesh	1.45@ 1.60
Moline, Ill., and Bettendorf, Iowa—Analysis, 97% $CaCO_3$, 2% $MgCO_3$; 50% thru 100 mesh; 50% thru 4 mesh	1.50
Pixley, Mo.—Analysis, 96% $CACO_3$; 50% thru 50 mesh..... 50% thru 100 mesh; 90% thru 50 mesh; 50% thru 50 mesh; 90% thru 4 mesh; 50% thru 4 mesh	1.25 1.65
River Rouge, Mich.—Analysis, 54% $CaCO_3$, 40% $MgCO_3$; bulk	.80@ 1.40
Stone City, Iowa. — Analysis, 98% $CaCO_3$; 50% thru 50 mesh	.75
Waukesha, Wis.—Test, 107.38% bone dry, 100% thru 10 mesh; bags, 2.85; bulk	2.10

Pulverized Limestone for Coal Operators

Hillsville, Penn., sacks, 4.50; bulk	3.00
Piqua, Ohio, sacks, 4.50@5.00 bulk	3.00@ 3.50
Rocky Point, Va.—80% thru 200 mesh	3.00@ 3.50
Waukesha, Wis.—97% thru 100 mesh, bulk	4.00

Miscellaneous Sands

Silica sand is quoted washed, dried and screened unless otherwise stated. Prices per ton f.o.b. producing plant.

Glass Sand:	
Berkeley Springs, W. Va.—	2.00@ 2.25
Cedarville and S. Vineland, N. J.—Damp	1.75
Dry	2.25
Cheshire, Mass.: 6.00 to 7.00 per ton; bbl.	2.50
Columbus, Ohio	1.25
Estill Springs and Sewanee, Tenn.	1.50
Franklin, Penn.	2.00
Gray Summit and Klondike, Mo.	1.75@ 2.00
Los Angeles, Calif.—Washed	5.00
Mapleton Depot, Penn.	2.00@ 2.25
Massillon, Ohio	3.00
Mineral Ridge and Ohlton, Ohio	2.50
Oceanside, Calif.	3.00
Ottawa, Ill.—Chemical and mesh guaranteed	1.25
Pittsburgh, Penn.—Dry	4.00
Damp	3.00
Red Wing, Minn.: Bank run	1.50
Ridgway, Penn.	2.00
Rockwood, Mich.	2.75@ 3.25
Round Top, Md.	2.25
San Francisco, Calif.	4.00@ 5.00
St. Louis, Mo.	2.00
Sewanee, Tenn.	1.50
Thayers, Penn.	2.50
Utica, Ill.	1.00@ 1.15
Zanesville, Ohio	2.50
Miscellaneous Sands:	
Aetna, Ind.: Core, Box cars, net, .35; open-top cars	.30
Albany, N. Y.: Molding coarse	2.00
Molding fine, brass molding	2.25
Sand blast	3.75
Arenzville, Ill.: Core	.75
Molding fine	1.50@ 1.75
Beach City, Ohio: Core	1.75

(Continued on next page)

Wholesale Prices of Sand and Gravel

Prices given are per ton, f. o. b. producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
EASTERN:						
Ambridge & So. H'g'ts, Penn.	1.25	1.25	1.15	.85	85	.85
Attica and Franklinville, N. Y.	.75	.75	.85	.75	.75	.75
Buffalo, N. Y.	1.10	.95	.....	.....	.85	.....
Erie, Penn.	.....	1.25	.....	1.50	1.75	.....
Farmingdale, N. J.	.58	.48	1.05	1.20	1.10	.....
Hartford, Conn.	.65*	.....	.....	.....	.....	.....
Machias Jct., N. Y.	.....	.75	.75	.75	.75	.75
Montoursville, Penn.	.....	1.10	1.10	1.00	.90	.90
Northern New Jersey	.50	.50	1.25	1.25	1.25	.....
Olean, N. Y.	.....	.75	.75	.75	.75	.75
Shining Point, Penn.	.....	.....	1.00	1.00	1.00	1.00
South Heights, Penn.	1.25	1.25	.85	.85	.85	.85
Washington, D. C.	.60@ .85	.60@ .85	.....	.....	.....	1.10@1.30
CENTRAL:						
Algonquin and Beloit, Wis.	.50	.40	.60	.60	.60	.60
Attica, Covington and Summit Grove, Ind.	.60@ .85	.60@ .85	.75@ .85	.75@ .85	.75@ .85	.75@ .85
Barton, Wis.	.....	.50	.75	.75	.75	.75
Chicago, Ill.	1.35‡	1.75‡	1.75‡	1.75‡	1.75‡	1.75‡
Columbus, Ohio	.75	.75	.50	.75	.75	.75
Des Moines, Iowa	.50	.40	1.50	1.50	1.50	1.50
Eau Claire, Wis.	.40	.40	.80	.....	.....	.85
Elkhart Lake, Wis.	.60	.40	.50	.50	.50	.50
Ft. Dodge, Iowa	.85	.85	2.05	2.05	2.05	2.05
Ft. Worth, Texas	2.00	2.00	2.00	2.00	2.00	2.00
Grand Rapids, Mich.	.....	.50	.....	.80	.70	.70
Hamilton, Ohio	.....	1.00	.....	.....	1.00	.....
Hersey, Mich.	.....	.50	.....	.....	.....	.70
Indianapolis, Ind.	.60	.60	.....	.90	.75@1.00	.75@1.00
Janesville, Wis.	.....	.65@ .75	.....	.....	.65@ .75	.....
Mason City, Iowa	.45@ .55	.45@ .55	1.35@1.45	1.45@1.55	1.40@1.50	1.35@1.45
Mankato, Minn., and Appleton	.....	.40	.....	1.25	1.25	1.25
Milwaukee, Wis.	.....	1.01	1.21	1.21	1.21	1.21
Moline, Ill.	.60@ .85	.60@ .85	1.00@1.20	1.00@1.20	1.00@1.20	1.00@1.20
Northern New Jersey	.45@ .50	.45@ .50	.....	1.25	1.25	.....
Palestine, Ill.	.75	.75	.75	.75	.75	.75
Silverwood, Ind.	.75	.75	.75	.75	.75	.75
St. Louis, Mo.	1.18	1.45	1.55	1.45	1.65	1.45c
Terre Haute, Ind.	.75	.60	.90	.90	.75	.75
Wolcottville, Ind.	.75	.75	.75	.75	.75	.75
Waukesha, Wis.	.....	.45	.60	.60	.65	.65
Winona, Minn.	.40	.40	1.25	1.10	1.10	1.00
Yorkville, Sheridan, Oregon, Moronts, Ill.			Average .60			
Zanesville, Ohio	.70	.60	.60	.60	.90	.....
SOUTHERN:						
Charleston, W. Va.			All sand, 1.40.	All gravel, 1.50.		
Chehaw, Ala.	00@ .30	.....	.40	.50	.....	.....
Knoxville, Tenn.	1.00	1.20	.....	1.20	1.20	1.20
Lindsay, Texas	.....	.....	.....	.....	.55	.....
Macon and Gaillard, Ga.	.....	.50	.....	.65	.65	.65
New Martinsville, W. Va.	1.00	.80@1.00	1.30	.....	.....	.80@ .90
Roseland, La.	.45	.40	1.75	1.25	1.00	1.00
Smithville, Texas	.....	.90	.90	.90	.90	.75
WESTERN:						
Baldwin Park, Calif.	.20	.20	.40	.50	.50	.....
Kansas City, Mo.	.80	.70	.....	.....	.....	.....
Los Angeles, Calif.	.50	.50	.92	.92	.92	.....
Los Angeles district (bunkers)†	1.50	1.40	1.85	1.85	1.85	1.85
Pueblo, Colo.	1.10*	.90*	.....	1.60*	.....	1.50*
San Diego, Calif.	.....	.60	1.25	1.20	1.00	1.00
Seattle, Wash. (bunkers)	1.50*	1.50*	1.50*	1.50*	1.50*	1.50*

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
Algonquin and Beloit, Wis.			Dust to 3 in., .40			
Boonville, N. Y.	.60@ .80	.....	.55@ .75	.....	.....	1.00
Chehaw, Ala.	00@ .30	.....	.....	.....	.....	.....
Des Moines, Iowa			Washed, .65; unwashed, .40 (not screened)			
Dudley, Ky. (crushed silica)	1.10	1.10	.90	.90	.....	.....
East Hartford, Conn.			Sand, .75 per cu. yd.			
Elkhart Lake, Wis.	.50	.....	.....	.....	.....	.....
Gainesville, Texas	.....	.95	.....	.....	.....	.55
Grand Rapids, Mich.	.....	.....	.....	.60	.....	.....
Hamilton, Ohio	.....	.....	.....	.....	.70	.....
Hersey, Mich.	.....	.....	.....	.55	.....	.....
Indianapolis, Ind.			Mixed gravel for concrete work, .65			
Lindsay, Texas	.....	1.10	.....	.....	.....	.55
Macon, Ga.	.....	.35	.....	.....	.....	.....
Mankato, Minn.			Pit run sand, .50			
Moline, Ill. (b)	.60	.60	Concrete gravel, 50% G., 50% S., 1.00			
Montezuma, Ind.	.....	.....	.....	.....	.....	.60
St. Louis, Mo.			Mine run gravel 1.55 per ton			
Shining Point, Penn.			Concrete sand, 1.10 ton			
Smithville, Texas	.50	.50	.50	.50	.50	.50
Summit Grove, Ind.	.50	.50	.50	.50	.50	.50
Waukesha, Wis.	.60	.60	.60	.60	.60	.60
Winona, Minn.	.60	.60	.60	.60	.60	.60
York, Penn.	1.00	1.00	.....	.....	.....	.....
Zanesville, Ohio	.....	.....	.....	.....	.....	.....

(a) ¾-in. down. (b) River run. (c) 2½-in. and less.
*Cubic yd. †Include freight and bunkerage charges and truck haul. ‡Delivered on job.

Miscellaneous Sands

(Continued from preceding page)

Furnace lining		2.50
Molding fine and coarse		**2.00**
Traction unwashed and screened		**1.75**
Cheshire, Mass.—Furnace lining, molding fine and coarse		5.00
Sand blast	5.00@	**8.00**
Stone sawing		**6.00**
Columbus, Ohio:		
Core	.30@	1.50
Traction	.30@	1.25
Molding coarse	1.25@	1.50
Stone sawing		1.50
Molding fine	1.75@	2.00
Furnace lining	2.00@	2.50
Sand blast	3.00@	4.00
Brass molding		2.00
Eau Claire, Wis.:		
Sand blast	3.00@	3.25
Elco, Ill.:		
Ground silica per ton in carloads	18.00@	31.00
Elnora, N. Y.:		
Brass molding	1.75@	2.00
Estill Springs and Sewanee, Tenn:		
Molding fine and core		**1.25**
Roofing sand, sand blast, traction	**1.35@**	**1.50**
Franklin, Penn.:		
Core, furnace lining, molding fine and coarse		1.75
Gray Summit and Klondike, Mo.:		
Stone sawing		1.00
Core, furnace lining, molding fine, roofing sand		**1.75**
Brass molding	1.75@	2.00
Sand blast		2.00
Joliet, Ill.:		
No. 2 molding sand; also loam for luting purposes and open-hearth work	**.65@**	**.85**
Kasota, Minn.:		
Stone sawing		1.00
Mapleton Depot, Penn.:		
Glass sand	2.00@	2.25
Molding fine and traction		2.00
Massillon, Ohio:		
*Glass sand		3.00
Core, furnace lining, molding fine and coarse		2.50
Traction		2.25
Michigan City, Ind.:		
Core, in open car, .30; in box car		.35
Traction		.25
Mineral Ridge and Ohlton, Ohio:		
Furnace lining, molding coarse, sand blast, traction (damp)		1.75
Roofing sand (damp)	1.75@	2.00
Core, molding fine (damp)		2.00
Montoursville, Penn.:		
Traction		1.10
Core	1.25@	1.50
New Lexington, Ohio:		
Molding fine		**2.00**
Molding coarse		**1.50**
Oceanside, Calif.:		
Roofing sand		3.50
Ottawa, Ill.:		
Molding coarse (crude silica, not washed or dried)	.75@	.85
Red Wing, Minn.:		
Core, furnace lining, stone sawing		1.50
Molding fine and coarse, traction		1.25
Sand blast		3.50
Filter sand		3.75
Ridgway, Penn.:		
Molding fine and coarse	1.25@	1.50
Furnace lining (loam sand)		1.50
Core	1.75@	2.00
Round Top, Md.:		
Core		1.60
Glass sand		2.00
Sand blast		2.25
Roofing sand		2.25
St. Louis, Mo.:		
Core	1.00@	1.75
Furnace lining		1.50
Molding fine	1.50@	2.50

Crushed Slag

City or shipping point		¼ in.	½ in.	¾ in.	1½ in.	2½ in.	3 in.
EASTERN:	Roofing	down	and less	and less	and less	and less	and larger
Buffalo, N. Y.	2.35@ 2.50	1.35@ 1.70	1.45@ 1.80	1.35@ 1.70	1.35@ 1.70	1.35@ 1.70	1.35@ 1.70
Eastern Penn. and Northern Penn.	2.50	1.20	1.50	1.20	1.20	1.20	1.20
Emporium and Dubois, Penn.	1.35	1.35	1.35	1.35	1.35	1.35	1.35
Reading, Pa.	2.50	1.00	.....	1.25	.....	.....	.....
Western Penn.	2.50	1.25	1.50	1.25	1.25	1.25	1.25
CENTRAL:							
Ironton, Ohio	2.05	1.45	1.75	1.45	.....	1.45	1.45
Jackson, Ohio	.....	1.05	.....	1.30	1.05	1.30	1.30
Toledo, Ohio	1.50	1.25	1.25	1.25	1.25	1.25	1.25
Youngst'n. O., dist.	2.00	1.25	1.35	1.35	1.25	1.25	1.25
SOUTHERN:							
Ashland, Ky.	.....	1.55	.....	1.55	1.55	1.55	1.55
Ensley and Alabama City, Ala	2.05	.80	1.25	1.15	.90	.90	.80
Longdale, Roanoke, Ruessens, Va.	2.50	1.00	1.25	1.25	1.25	1.15	1.15

Lime Products (Carload Prices Per Ton F.O.B. Shipping Point)

	Finishing	Masons'	Agricultural	Chemical	Ground burnt lime,		Lump lime,	
EASTERN:	hydrate	hydrate	hydrate	hydrate	Blk.	Bags	Blk.	Bbl.
Berkeley, R. I.	.....	.....	12.00	.....	.....	.....	.....	2.20
Buffalo, N. Y.	.....	12.00	12.00	12.00	.....	.....	.....	.....
Lime Ridge, Penn.	.....	.....	.....	.....	.....	.....	5.00a	.....
West Stockbridge, Mass. (f)	13.00	10@11.00	5.00	.....	.....	.....	.....	2.25t
Williamsport, Penn.	.....	.....	10.00	.....	.....	.....	6.00	.....
York, Penn.	.....	10.50	10.50	11.50	.....	.....	8.50	1.65i
CENTRAL:								
Cold Springs, Ohio (f)	.....	10.00	.....	.....	.....	.....	9.00	.....
Delaware, Ohio	12.50	10.00	9.00	10.50	9.00	15.00	9.00	1.50
Gibsonburg, Ohio	12.50	.....	.....	.....	.....	.....	.....	.....
Huntington, Ind.	12.50	10.00	9.00	.....	.....	.....	.....	.....
Luckey, Ohio (f)	12.50	.....	.....	.....	.....	.....	.....	.....
Marblehead, Ohio	.....	10.00	9.00	.....	.....	.....	9.00	1.50c
Marion, Ohio	.....	10.00	9.00	.....	.....	.....	9.00	1.50c
Sheboygan, Wis.	.....	.....	.....	.....	.....	.....	9.50	.....
Tiffin, Ohio	.....	.....	.....	.....	9.00	.....	.....	.....
White Rock, Ohio	12.50	.....	.....	.....	9.00	11.00	.....	.....
Woodville, Ohio (f)	12.50	10.00	9.00	.....	9.00	10.00	9.00	1.50
SOUTHERN:								
El Paso, Texas	.....	.....	.....	.....	.....	.....	10.00	1.75
Graystone, Wilmay and Landmark, Ala.	12.50	11.00	.....	11.00	.....	10.00	8.50	.....
Karo, Va.	.....	10.00	9.00	.....	.....	.....	7.00g	1.65h
Knoxville, Tenn.	20.50	11.00	.....	.....	.....	1.35	8.00	1.50
Ocala and Zuber, Fla.	13.00	12.00	10.00	.....	.....	1.50	12.00	1.70
Varnons, Ala. (f)	.....	10.00p	10.00p	.....	.....	.....	8.00q	1.40r
WESTERN:								
Kirtland, N. M.	.....	.....	.....	.....	.....	.....	15.00	.....
San Francisco, Calif.	20.50	19.50	16.00	.....	.....	.....	14.50	2.25

†50-lb. paper bags, burlap 24.00; (a) run of kilns: (c) wooden, steel 1.70; (d) wood; (e) per 180-lb. barrel; (f) dealers' prices; (g) to 9.50; (h) to 1.75; (i) 200-lb. bbl., 1.65, 300-lb bbl., 2.65; (m) finishing lime, 3.00 common; (n) common lime; (o) high calcium; (p) to 11.00; (q) to 8.50; (r) to 1.50; (s) in 80-lb. burlap sacks; (t) common, 2.50 plastering; 3.00 finishing; (u) two 90-lb. bags.
*Quoted f.o.b. New York.

Miscellaneous Sands

(Continued)

Molding coarse	1.25@	**1.75**
Roofing sand		**1.75**
Sand blast	3.50@	4.50
Stone sawing	1.25@	2.25
Traction		**1.25**
Brass molding	2.00@	3.00
San Francisco, Calif:		
(Washed and dried) — Core, sand blast and brass molding	3.50@	5.00
Furnace lining and roofing sand	3 50@	4.50
Molding fine and traction		3.50
Molding coarse		4.50
(Direct from pit)—Core and molding fine	2.50@	4.50
Sewanee, Tenn.:		
Molding fine and coarse, roofing sand, sand blast, stone sawing, traction, brass molding		1.25
Skerkston, Ont.:		
Traction (lake sand)		.65
Tamalco, Ill.:		
Molding coarse	1.25@	1.50
Tamms, Ill.:		
Ground silica per ton in carloads	20.00@	31.00
Thayers, Penn.:		
Core		**2.00**
Molding fine and coarse		**1.25**
Traction		**2.25**
Utica, Ill.:		
Core, furnace lining, brass molding (crude)	.60@	1.15
Molding fine and coarse (crude)	.55@	1.15
Traction		1.00
Roofing sand	1.00@	2.75
Stone sawing	1.00@	2.85
Sand blast	2.85@	3.50
Core		.65
Molding fine		.60
Furnace lining and molding coarse		.70
Utica, Penn.:		
Core		2.00
Molding fine and coarse		1.75
Warwick, Ohio.:		
Core, molding fine and coarse (green)		1.75
Core, molding fine (dry)		2.25
Zanesville, Ohio:		
Core and molding coarse	1.50@	1.75
Molding fine, brass molding		1.75
Traction		2.50

Talc

Prices given are per ton f.o.b. (in carload lots only), producing plant, or nearest shipping point

Baltimore, Md.:		
Crude talc (mine run)	3.00@	4.00
Ground talc (20-50 mesh), bags		10.00
Cubes		55.00
Blanks (per lb.)		.08
Pencils and steel workers' crayons, per gross		1.25
Chatsworth, Ga.:		
Crude talc		4.50
Ground talc (20-50 mesh) bags	7.00@	8.00
Ground talc (150-200 mesh) bags	8.00@	15.00
Chester, Vt.:		
Ground (150-200 mesh), bags	9.00@	15.00
Bags	10.00@	11.00
Chicago and Joliet, Ill.:		
Ground (150-200 mesh), bags		30.00
Emeryville, N. Y.:		
(Double air floated) including bags;		
325 mesh		14.75
200 mesh		13.75
Hailesboro, N. Y.:		
Ground white talc (double and triple air floated) including bags, 350 mesh	15.50@	20.00
Henry, Va.:		
Crude (mine run)	3.50@	4.00
Ground (150-200 mesh), bags	9.00@	15.00
Keeler, Calif.:		
Ground (200-300 mesh), bags	20.00@	30.00
Natural Bridge, N. Y.:		
Ground talc (300-325 mesh), bags		13.00

Rock Phosphate

Prices given are per ton (2240-lb.) f.o.b. producing plant or nearest shipping point.

Lump Rock

Gordonsburg, Tenn.—B.P.L. 68-70%	4.00@	5.00
Mt. Pleasant, Tenn.—B.P.L. 72%	5.50@	6.00
B.P.L. 75%	6.00@	6.50
B.P.L. 75% (free of fines for furnace use)	6.50@	6.75
Tennessee—F. O. B. mines, gross ton, unground Tenn. brown rock, 72% min. B.P.L.		**5.50**
Twomey, Tenn.—B.P.L. 65%, 2000 lb.	7.00@	8.00

(Continued on next page)

Roofing Slate

The following prices are per square (100 sq. ft.) for Pennsylvania Blue-Gray Roofing Slate, f. o. b. cars quarries:

Sizes	Genuine Bangor, Washington Big Bed, Franklin Big Bed	Genuine Albion	Slatington Small Bed	Genuine Bangor Ribbon
24x12, 24x14	10.20	10.00	8.10	7.80
22x12	10.80	10.00	8.40	8.75
22x11	10.80	10.50	8.40	8.75
20x12	12.60	10.50	8.70	8.75
20x10, 18x10, 18x9, 18x12	12.60	11.00	8.70	8.75
16x10, 16x9, 16x8, 16x12	12.60	11.00	8.40	8.75
14x10	**11.10**	**11.00**	**8.10**	**7.80**
14x8	11.10	10.50	8.10	7.80
14x7 to 12x6	9.30	10.50	7.50	7.80
	Mediums	Mediums	Mediums	Mediums
24x12	$ 8.10	$8.10	$7.20	$5.75
22x11	8.40	8.40	7.50	5.75
Other sizes	8.70	8.70	7.80	5.75

For less than carload lots of 20 squares or under, 10% additional charge will be made.

(Continued from preceding page)

Ground Rock

(2000 lb.)

Gordonsburg, Tenn.—B.P.L., 68-72%..	4.00@ 5.00
Mt. Pleasant, Tenn.—B.P.L. 65%.....	6.50
13% phosphorus, 95% thru 80 mesh	5.75
Twomey, Tenn.—B.P.L., 65%.....	7.00@ 8.00

Florida Phosphate

(Raw Land Pebble)

Per Ton

Florida—F. O. B. mines, gross ton, 68/66% B.P.L., Basis 68%.....	2.50
70% min, B.P.L., Basis 70%.....	2.75
72% min. B.P.L., Basis 72%.....	3.00
75/74% B.P.L., Basis 75%.....	4.00

Fluorspar

Fluorspar, 85% and over calcium fluoride, not over 5% silica, per net ton, f.o.b. Illinois and Kentucky mines	16.00
No. 2 lump, per net ton.....	19.00
Fluorspar, foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Philadelphia, duty paid, per net ton	15.00@16.00
Fluorspar, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, per net ton, f.o.b. Illinois and Kentucky mines.....	32.50

Special Aggregates

Prices are per ton f. o. b. quarry or nearest shipping point.

City or shipping point	Terrazzo	Stucco chips
Barton, Wis., f.o.b. cars	.....	10.50
Brandon, Vt. — English pink and English cream	*11.00	*11.00
Chicago, Ill.—Stucco chips, in sacks f.o.b. quarries	.....	17.50
Crown Point, N. Y.—Mica Spar	.....(a)	10.00@12.00
(a) Includes bags.		
Easton, Penn., and Phillipsburg, N. J.—Green granite	12.00@16.00	16.00@20.00
Haddam, Conn. — Felstone buff	15.00	15.00
Harrisonburg, Va.—Blk marble (crushed, in bags	†12.50	†12.50
Ingomar, Ohio	.....	10.00@20.00
Middlebrook, Mo.—Red	.....	20.00@25.00
Middlebury, Vt. — Middlebury white	‡9.00	‡9.00
Milwaukee, Wis.	.....	14.00@34.00
Newark, N. J.—Roofing granules	.....	7.50
New York, N. Y.—Red and yellow Verona	.....	32.00
Red Granite, Wis.	.....	7.50
Sioux Falls, S. D.	7.50	7.50
Stockton, Cal. — "Natrock" roofing grits	.....	†12.00
Tuckahoe, N. Y.	.....	12.00
Villa Grove, Colo.	.....	13.00
Wauwatosa, Wis.	.....	16.00@45.00
Wellsville, Colo.—Colorado Travertine Stone	15.00	15.00

†C.L. Less than C. L., 15.50.
*C.L. including bags; L.C.L. 12.50.
‡C.L. including bags; L.C.L. 10.00.

Concrete Brick

Prices given per 1000 brick, f.o.b. plant or nearest shipping point.

	Common	Face
Appleton, Minn.	22.00	26.00@32.00
Baltimore, Md. (Del. according to quantity)	16.00@16.50	22.00@50.00
Ensley, Ala. ("Slagtex")	12.50	22.50@33.50
Eugene, Ore.	25.00	35.00@75.00
Friesland, Wis.	22.00	32.00
Milwaukee, Wis.	15.00@16.00	30.00@42.00
Omaha, Neb.	18.00	30.00@40.00
Philadelphia, Penn.	†15.25	‡21.50
Portland, Ore.	17.00	25.00@45.00
Prairie du Chien, Wis.	14.00	25.00@32.00
Rapid City, S. D.	18.00	25.00@45.00
Watertown, N. Y.	20.00	35.00
Wauwatosa, Wis.	14.00	20.00@42.00
Winnipeg, Man.	14.00	22.00

†Gray. ‡Red.

Sand-Lime Brick

Prices given per 1000 brick f. o. b. plant or nearest shipping point, unless otherwise noted.

Barton, Wis.	10.50
Boston, Mass.	14.00@15.50
Brighton, N. Y.	16.75
Dayton, Ohio	12.50@13.50
Farmington, Conn.	14.00
Grand Rapids, Mich.	12.00
Hartford, Conn.	14.00
Jackson, Mich.	13.00
Lancaster, N. Y.	13.00
Michigan City, Ind.	12.00
Milwaukee, Wis.	13.00
Portage, Wis.	15.00
Rochester, N. Y. (del. on job)	19.75
Saginaw, Mich.	13.00
San Antonio, Texas	13.50@15.00
Syracuse, N. Y.	16.00@18.00
Terra Cotta, D. C.	13.50
Wilkinson, Fla.—White	13.00
Buff	17.00

Gray Klinker Brick

El Paso, Texas	13.00

Lime

Warehouse prices, carload lots at principal cities.

	Hydrated, per ton Finishing	Common
Atlanta, Ga.	22.50	14.00
Baltimore. Md.	24.25	17.85
Boston, Mass.	20.00	13.50@15.00
Cincinnati, Ohio	16.80	14.30
Chicago, Ill.	20.00	18.00
Dallas, Tex.	20.00	——
Denver, Colo.	24.00	——
Detroit, Mich.	12.40	12.40
Kansas City, Mo.	19.50	18.50
Los Angeles, Calif.	.....	18.00
Minneapolis, Minn. (white)	25.50	21.00
Montreal, Que.	.....	21.00
New Orleans, La.	24.00	16.00
New York, N. Y.	18.20	12.00@13.10
Philadelphia, Penn.	23.00	16 00
St. Louis, Mo.	23.00	19.00
San Francisco, Calif.	.....	22.00
Seattle, Wash. (paper sacks)	24.00	——

Portland Cement

Prices per bag and per bbl. without bags net in carload lots.

	Per Bag	Per Bbl.
Boston, Mass.	.....	2.63
Buffalo, N. Y.	.....	2.48
Cedar Rapids, Iowa	.....	2.44
Cincinnati, Ohio	.....	2.47
Cleveland, Ohio	.....	2.39
Chicago, Ill.	.....	2.20
Columbus, Ohio	.....	2.44
Dallas, Texas	.48¾	1.95
Davenport, Iowa	.....	2.39
Dayton, Ohio	.....	2.48
Denver, Colo.	.63¼	2.55
Detroit, Mich.	.....	2.25
Duluth, Minn.	.....	2.19
Indianapolis, Ind.	.....	2.39
Kansas City, Mo.	54¼	2.17
Los Angeles, Calif.	.63	2.52
Louisville, Ky.	.....	2.45
Memphis, Tenn.	.65	2.60
Milwaukee, Wis.	.....	2.25
Minneapolis, Minn.	.....	2.42
Montreal, Que.	.....	1.90
New York, N. Y.	.....	2.25
Omaha, Neb.	.62¾	2.51
Philadelphia, Penn.	.....	2.41
Pittsburgh, Penn.	.....	2.19
San Francisco, Calif.	.....	2.71*
St. Louis, Mo.	.....	2.30
St. Paul, Minn.	.....	2.42
Seattle, Wash. (10c discount)	.....	2.65
Toledo, Ohio	.....	2.40

NOTE—Add 40c per bbl. for bags.

Mill prices f.o.b. in carload lots, without bags, to contractors.

	Per Bag	Per Bbl.
Buffington, Ind.	.....	1.95
Concrete, Wash.	.....	2.35
Davenport, Calif.	.....	2.05
Hannibal, Mo.	.....	2.05
Hudson, N. Y.	.....	2.45*
Leeds, Ala.	.....	1.95
Mildred, Kan.	.....	1.95
Nazareth, Penn.	.....	1.95
Northampton, Penn.	.....	1.95
Steelton, Minn.	.....	2.00
Universal, Penn.	.....	1.95

*Including sacks at 10c each.

Cement Products

Hawthorne tile, carload lots, f.o.b. Cicero, Ill.

	Per sq.
Red French	9.50
Green French	11.50
Red Spanish	12.00
Green Spanish	12.00

	—Cicero— Red	Green
Ridges	.25	.35
Hips	.20	.30
Ridge closers	.05	.06
Hip terminals, 3 way	1.25	1.50
Hip starters	.50	.60
Gable finials	1.25	1.50
Gable starters	.20	.30
End bands	.20	.30
Eave closers	.06	.08

Gypsum Products—CARLOAD PRICES PER TON AND PER M SQUARE FEET, F. O. B. MILL

	Crushed Rock	Ground Gypsum	Agricultural Gypsum	Stucco Calcined Gypsum	Cement and Gauging Plaster	Wood Fiber	White Gauging	Sanded Plaster	Keene's Cement	Trowel Finish	—Plaster Board— ⅛x32x 36". Wt. 1500 lb. Per M Sq. Ft.	⅜x32x 36". Wt. 1850 lb. Per M Sq. Ft.	Wallboard, ⅜x32 or 48". Lgths. 6'-10', 1850 lb. Per M Sq. Ft.
Centerville, Iowa	3.00	12.00	12.00	9.00	10.00	†0.50	11.00	.....	25.80	11.00	.....	.....	.....
Douglas, Ariz.	.....	.....	7.00	.....	16.5‡	.....	19.50	.....	.....	15.50	.....	.....	.....
Grand Rapids, Mich.	2.75	6.00	6.00	8.00	9.00	9.00	17.50	.....	26.55	20.00	.....	.....	.....
Gypsum, Ohio‡	3.00	4.00	6.00	8.00	9.00	9.00	19.00	7.00	27.00	19.00	20.00	20.00	30.00
Hanover, Mont.	.....	.....	.....	11.80	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles, Calif.	.....	.....	.....	8.00b@10.40c	.....	.....	.....	.....	.....	.....	.....	.....	.....
Port Clinton, Ohio	3.00	4.00	6.00	10.00	9.00	9.00	21.00	7.00	30.15	20.00	.....	20.00	30.00
Portland, Colo.	.....	.....	.....	10.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Francisco, Calif.	.....	.....	.....	.....	16.40	.....	17.40	.....	.....	.....	.....	.....	.....
Sigurd, Utah	.....	.....	.....	.....	.....	.....	.....	.....	18.00a	.....	.....	.....	.....
Winnipeg, Man.	5.50	5.50	7.00	13.50	15.00	15.00	.....	.....	.....	.....	22.00	.....	34.00

NOTE—Returnable bags, 10c each; paper bags, 1.00 per ton extra (not returnable).

*To 3.00; †to 11.00; ‡to 12.00; ‡prices per net ton, sacks extra; (a) to 21.00; (b) net; (c) gross.

New Machinery and Equipment

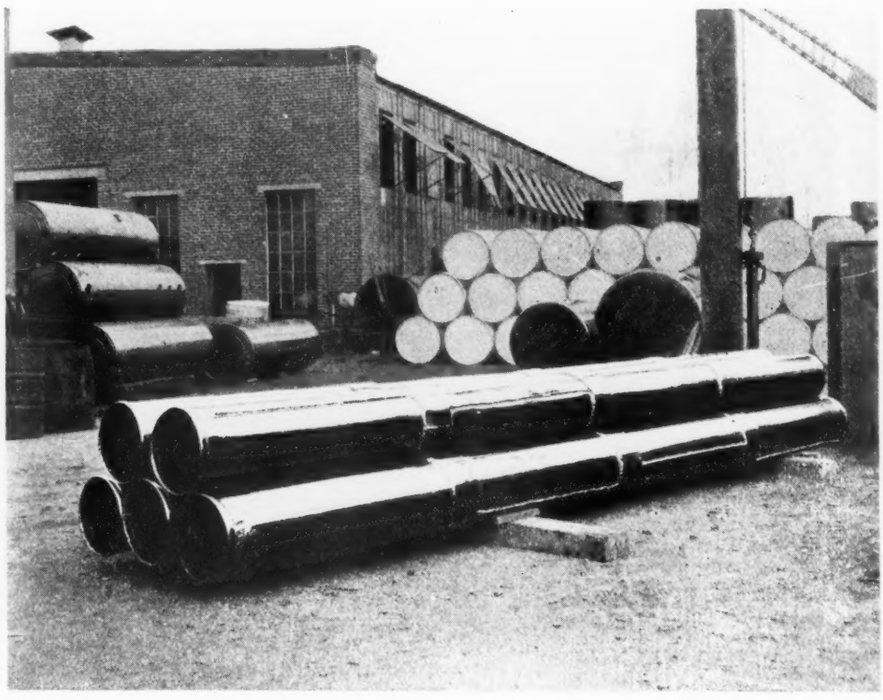
Manganese-Steel Dredge Pipe

THE Manganese Steel Forge Co., Philadelphia, Pa., submits the accompanying view as evidence of the rapidly growing use of manganese steel in the rock products industries. The view shows some recently completed 20-ft. sections of "Rod-man" manganese steel welded pontoon dredge pipe.

The pipe is made up of four sheets, 5 ft. long, rolled manganese plates 5/32 in. thick. The sheets are rolled to a full circle and welded. The outside horizontal and circular seams are strapped with soft steel; they are, of course, not subjected to wear as is the interior of the pipe. All seams and joints are electrically welded.

The ends are fitted with 1½x⅜-in. half oval band iron for securing the sections together when the rubber-sleeve connections are clamped on.

The pipe was made for one of the large sand and gravel dredging operations on the Delaware River above Philadelphia.



Manganese-steel dredge pipe

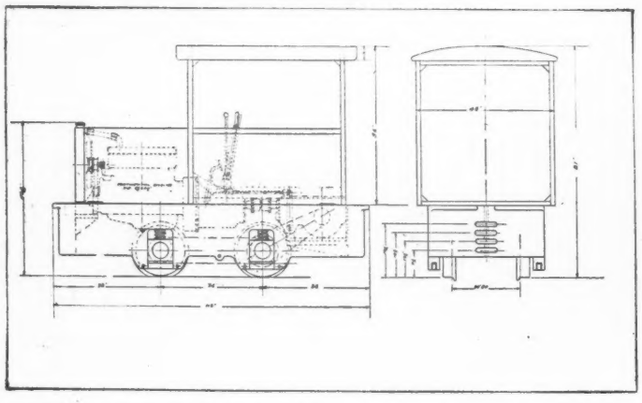
End view of 4-ton locomotive

A New 4-Ton Gasoline Locomotive

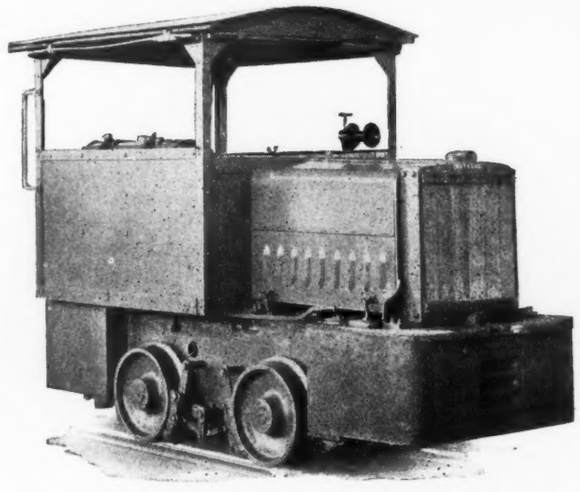
WHILE most of the developments recently in gasoline locomotives have been toward larger and heavier machines, there is still a wide field and a considerable demand for the lighter types. To meet this demand the George D. Whitcomb Co., Rochelle, Ill., has recently brought out a new four-ton locomotive, known as Model "U. F.-4."

The new "U. F.-4" is built to regular gasoline locomotive specifications, the same as are all Whitcomb locomotives, the general design and construction being identical with the larger sizes.

The Whitcomb "U. F.-4" is made in all track gauges to meet the various conditions in pits, quarries, mines, road contract work and industrial plants, and is so made that special variations of the cab for special conditions can easily be arranged.



Principal dimensions of 4-ton locomotive



The locomotive is mounted on a solid cast-iron chassis

In the standard "U. F.-4," the height over the engine is 54 in., the height over the cab being 82 in., the wheel base being 36 in., and the length approximately 9 ft.

The "U. F.-4" is built upon a solid, cast iron chassis, very rugged in design, and the whole unit, in working order, weighs approximately 8,000 lb. with an average draw bar pull of 1600 lb. Coil springs are provided on each journal box and effect an easy riding action.

The coupling device is so arranged as to allow for coupler heights 9½ in., 12½ in., 15½ in. and 18½ in., which, as a whole, take care of all standard cars.

New 20-Ton Gasoline Locomotive

TO meet the prevailing demand for heavier gasoline locomotives, the Vulcan Iron Works, Wilkes-Barre, Penn., have recently developed a new 20-ton machine, to be known as their Model HS-20.

Steam locomotive practice is followed very closely in the chassis construction, the frames being of open-hearth cast steel (open bar type), which affords long life and accessibility to all underneath parts. Springs are of elliptic type with cross-equalizing arrangement giving three-point suspension. On standard gauge track, in shifting railroad cars—for which work this machine is primarily adapted—the locomotive is furnished with M. C. B. automatic couplers with spring buffer and draft rigging arrangement in the bumpers. This device takes up the shocks encountered in coupling and relieves the strains in pulling and pushing the heavy railroad cars, thereby protecting the motor and other working parts of the locomotive. The locomotive is mounted on four steel-tired driving wheels.

The locomotive is powered with a 6-cylinder 125-h.p. motor.

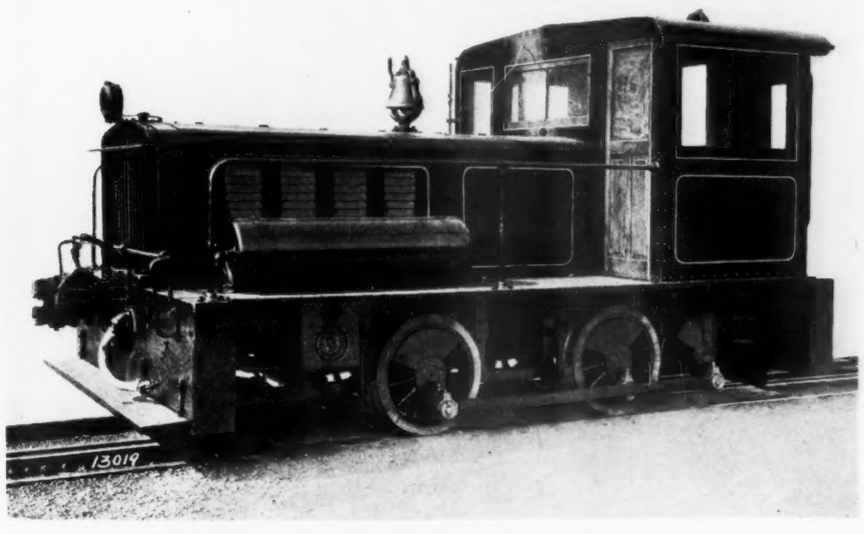
The motor is equipped with modern accessories, such as electric starter and generator, Stromberg carburetor, and storage battery. The locomotive is provided with an oversized multiple disc clutch running in a bath of oil, providing for an easy and smooth starting of the load with very light pressure on the foot pedal, thus making pedalling very comfortable. The especially progressive action of this clutch avoids fierce engagement of sudden jerking and it has been conclusively proved to be the only one capable of long period slipping as part of its regular work, and at the same time assuring rapid radiation of heat without burning up the oil or buckling the plates.

The transmission is a perfected trouble-proof transmission that insures efficiency by completely eliminating gear clashing and the difficulties that grow out of gear shifting. By using constant mesh gears instead of the sliding type, speed changes are made quicker and easier without loss of acceleration to the locomotive. The speed changes are made by the engagement of indestructible jaw clutches. Gears, clutches and shafts are chrome nickel alloy steel forgings properly heat-treated and hardened, thereby insuring long life and no replacements.

The final drive is by means of driving and parallel rods from cranks on the jack shaft to the crank pins in the driving wheels, traction being thus provided on all wheels.

The air equipment is of the straight air and automatic brake type, complete with air compressor, distributor valve, reservoirs, and all accessories. The air compressor is driven from a power take-on on the transmission and is provided with an automatic governor throwing the air compressor out of engagement when the pressure in the reservoir reaches a pre-determined point.

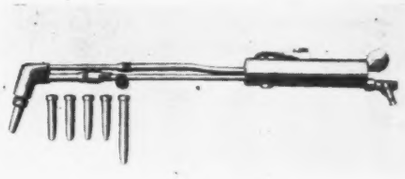
The locomotive is designed for four speeds forward and four speeds reverse, geared from 2 to 15 miles per hour, with a maximum drawbar pull of 12,000 lb.



New 20-ton gasoline locomotive with 125-h.p. motor

Low Pressure Combination Cutting and Welding Torch

A LOW-PRESSURE torch, which is claimed to operate on either low-pressure or high-presure gas with equal efficiency, has been placed on the market by the Alexander Milburn Co., Baltimore, Md. It is especially constructed to operate with low-pressure acetylene gas, city gas or hydrogen, especially with a low-pressure acetylene generator.

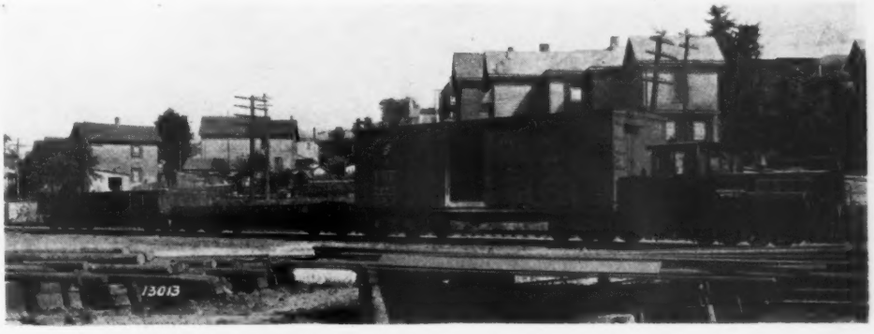


Low-pressure torch

This torch is very efficient and utilizes the highly specialized and standarized parts of the Milburn cutting and welding torches It insures a correct and ultimate mixture of the oxygen and acetylene resulting in "super-mixing" and non-flashback qualities, according to its manufacturers.

This torch is adapted to perform welding as well as cutting work by the mere interchange of tips.

The torch is of bronze forgings and special seamless tubing, constructed to withstand constant service. The tips are made of solid copper and are interchangeable with a large number of low pressure torches of other makes. This torch carries with it the same guarantee as the standard apparatus.



The locomotive is particularly adapted for switching railroad cars

Portland Cement Association to Build Own Home

Five-Story Office and Laboratory Building Contracted for at Grand Avenue and Dearborn Street, Chicago, Will Be Modern Example of Economy and Fire Safety as Well as Architectural Possibilities Attainable with Concrete

CONTRACTS have just been let by the Portland Cement Association to the Turner Construction Co. of New York for a five-story office and laboratory building at the southeast corner of Grand avenue and Dearborn street, Chicago. This reinforced-concrete structure is to be the general headquarters and home of the Portland Cement Association which for the past ten years has had its general offices on the fifteenth floor of the Conway building. During the same period the Association's research laboratory, which is known from one end of the country to the other as the Structural Materials Research Laboratory, has been located in the Lewis Institute, Madison and Robey streets, where it has been conducted co-operatively by the Association and the institute. The laboratory work has grown rapidly in importance for several years past, not only to engineers and architects, but to individual users of cement. As a matter of fact, the dissemination of the findings of research work, which has made the Association recognized as one of the greatest service organizations in the country has called for a continual increase in the general staff which has required continual expansion of office and laboratory quarters.

The Turner Construction Co. has for many years been recognized as one of the largest and foremost specialists in the erection of reinforced-concrete mercantile, office and industrial buildings throughout the eastern half of the United States. Their contracts for such work during 1924 involved the erection of some $15,000,000 worth of new buildings.

Holabird and Roche, well known Chicago architects, planned the Association's

Architect's sketch of the new home of the Portland Cement Association in Chicago, contracts for which have just been let

new home. Their work is well known in many cities, as well as in Chicago, where they have designed such buildings as the new Palmer House, the Morrison hotel, the University club, the Grant Park stadium, etc.

Foundations for the Association building will be such as to permit the erection of additional stories if increased demands on the Association for service to cement users call for more space.

The architects, co-operating with the building committee of the Association and its engineers, have planned a building which is distinctive primarly because substantial, firesafe and expressing the economies capable with reinforced-concrete design, as well as the architectural possibilities of concrete from the standpoint of art in architecture.

Precast concrete stone similar to that used in the Grant Park stadium on the lake front will be used for the Grand avenue and Dearborn street elevations. Monolithic concrete walls will be used on the other sides. On the interior there will be free use of cast concrete stone. The decorative wainscoting of the entrance vestibule, reception room, elevator lobby and conference rooms will be of cast stone or art marble—man-made stone consisting of portland cement and selected marble chips as aggregates. In various places throughout the building the plaster and cast concrete products used will demonstrate some of the many color possibilities of concrete.

All floors will be of two-way, reinforced concrete slabs supported upon reinforced concrete beams. In some of the rooms, the concrete floor slab will be finished with terrazzo, cement tile or art marble, all demonstrating the latest word in the concrete maker's art. Most of the floors are designed for uniform loading of 100 lb. per sq. ft. The first floor is designed for 150-lb. loading because of heavy laboratory equipment; while the floor of the moist room located in the basement will be designed to carry a load of 500 lb. per sq. ft., because of the great weight of specimens carried in tests.

In order to carry out the architectural effect of long vertical lines, sash of the casement type having a reveal of only 2½ in. will be used. The roof is also to be of reinforced concrete and will be covered with a layer of insulation consisting of slab cork 1 in. thick, and will be used also to store specimens that are to be exposed to the weather. Portland cement plaster applied directly on the concrete surfaces or on brick or tile will be used on the interior where the finish is other than cast stone, and will display workmanship of artisans in the plastering craft illustrating the wide variety of surfaces and texture possible through the use of portland cement.

An unusual feature of the work is the fact that for the first time the specifications will follow throughout the entire work the recently developed methods of field control of concrete. In other words, the concrete mixtures will be designed for a definite strength on the basis of the water-cement ratio principle of concrete design developed in the Association laboratory.

So far as is known the Portland Cement Association will be the only association of its kind to own its home. Nearly 23 years of continued progress stands to the credit of the cement industry through the scientific, educational research work for which its 89 members throughout the United States, Canada, Cuba and Mexico maintain the activities of the Association. No better evidence of the common acceptance of its objects and aims is needed than the fact that its membership has sufficient confidence in the value of its service to the public to provide a permanent home for its many activities.

Effect of Fine Grinding of Portland Cement on the Strength of Concrete

ABOUT ten years ago the U. S. Bureau of Standards began an investigation to determine the effect of fine grinding of cement on the strength of concrete. Since the beginning of the work other investigators have shown this effect for short periods of time, usually one year. It is felt that the Bureau's tests are of particular interest, as they extend over a 10-year period, and show the effect of fine grinding on the strength of concrete at definite intervals of time during this period.

For the investigation five commercial brands of cement, as received direct from the manufacturers and representative of their marketable product, were used. Each cement as it was received was thoroughly mixed and divided into two lots. One lot was used as received for making concrete, while the other was ground in a ball mill for one and one-half hours before use.

Concrete cylinders 8 by 16 in. were made from both lots of cement, Potomac river sand and gravel being used as the aggregate. The materials were proportioned either 1:2:4 or 1:3:6 by volume. After remaining in the molds for 24 hours the specimens were stored in moist air for 28 days. After the 28 days' curing the specimens were placed out of doors exposed to Washington weather conditions until broken. Compressive tests were made at the 7-day, 28-day, 6-month, 1, 2, 3, 5, and 10 year periods. The extreme variation in fineness in the two lots of any one cement was 20.1% on the standard No. 200 cement sieve.

From the results of these tests the following conclusions may be drawn: No retrogression is shown in the compressive strength of the concretes at the end of the 10-year period. In general, the fineness of the cement increased the strength of the concrete. All cements do not give the same increase in strength with the same increase in fineness. The effect of fineness of cement on the strength of concrete diminishes with age. The 1:2:4 mixes show better increases of strength with the same increase in fineness than do the 1:3:6 mixes.

United States Chamber of Commerce Wants Trade Associations to Use Statistics

DEVELOPMENT and proper use of business statistics by trade associations, along the lines laid down by the recent decisions of the United States Supreme Court, is strongly urged by the Department of Manufacture of the Chamber of Commerce of the United States.

The bulletin just issued starts out by saying that "for years trade associations have been faced with doubts about statistical activities in which they could lawfully engage. The members of many associations had come to fear that statistics of any kind were, in the opinion of prosecuting officials, inherently wrongful, when they related to economic activity, although in every other walk of life statistics were held in high esteem.

"In this situation the Supreme Court itself has granted relief. On June 1 it handed down its opinion in two cases brought by the Department of Justice against trade associations, holding that the statistical activities of these associations were lawful. Thus, these opinions serve to indicate for all trade associations that there is no violation of the federal anti-trust laws if they gather and distribute the essential business facts which the Supreme Court described.

"With the clearer understanding of this liberty under the law (which remains unchanged), there is no bar to the development and proper use of business statistics. This clearing of atmosphere should mark the passing of guessing as to the facts concerning our commodity production and distribution provided there is a willingness, at source, to supply the information. It is in the hands of each member of an industry to make possible complete and accurate figures for his line by his own contribution."

"It should be borne in mind," the bulletin goes on to say, "that the favorable rulings of the court in the so-called 'Cement and Maple Flooring Cases' were based on the facts adduced in each case, just as their previous rulings in the Hardwood and Linseed Oil Cases were predicated on facts obtaining in these cases, the law remaining unchanged."

The Department of Manufacture announced that it will co-operate with trade associations interested, and will endeavor to bring about the contribution and interchange of information and experience which will prove of interest and value in this work.

News of All the Industry

Incorporations

Consumers' Sand and Gravel Co., $50,000; W. G. Phillips, Sewickley, Pa.

American Concrete Products Co., Dallas, Texas; P. A. Ritter, 4901 Live Oak St.

Brown Sand and Gravel Co., Chattanooga, Tenn., $50,000; R. J. Brown.

Standard Building Tile Co., Baton Rouge, La.; Andrew Clausen, William F. Green.

Ocean Stone and Gravel Co., Tampa, Fla.; Fred H. Davis, H. C. Crawford.

General Sand and Supply Co. Wilmington, Del., $825,000 (Corp. Trust Co. of America).

Prospect Sand and Gravel Co., West Allis, Wis.; John Turck and Abe Bruegger.

Dabney and Arledge Concrete Co., St. Petersburg, Fla.; P. L. Gregory, N. B. Arledge.

Sarasota Cement Products Co., Sarasota, Fla., $50,000; J. F. Baumgartner, R. P. Thacker.

Midway Sand and Gravel Co., Parkersburg, W. Va., $60,000; J. L. Williams, L. H. Mallory.

Stone-Advance Industrial Supply Co., Pacific, Mo., $20,000; S. G. Wright, E. E. Stephenson.

Kansas Lime Mining Co., Kansas City, Mo., $34,000; Frank R. Grant, 623 Greenway Terrace.

American Asphalt Co., Dallas, Texas, $5,000; J. D. Forrester, A. F. Caldwell, E. P. Dougherty.

York Valley Lime and Stone Co., Philadelphia, Pa., $100,000; Corporation Guarantee and Trust Co.

Miller Sand Co., Knoxville, Tenn., $5,000; B. R. Winick, W. E. Layman, E. D. Yarnell, L. B. Kohler.

Minden Sand and Gravel Co., Minden, La., $25,000; D. Moody, president; R. Williams, secretary.

Super Concrete Supply Co., Tampa, Fla., $10,000; L. N. Dantzler, Sr., and William Dean Ham.

James B. Williams Slate Co., Kansas City, Mo., $30,000; J. E. Williams, 1548 South Vandeventer street, and others.

New Hope Gravel Co., Columbus, Miss., $55,000; W. J. Shackelford, Columbus; George McGee, Rosedale and others.

Schoharie Limestone Co., Schoharie, N. Y., $5,000; K. Kelly, W. P. and S. H. Mix, M. S. Mix (attorney).

Bangor Ideal Slate Mining Co., Bangor, Pa., $30,000; G. Water Trayes, 1101 Harrison St., Philadelphia, Pa.

Alexandria, Va.—T. C. Baker, of Purcellville, Va., contemplates the building of plant to develop talc and soapstone products.

No-Equal Sand and Gravel Co. Reading, Pa., $5,000; G. F. and E. D. Rhoads, H. C. and H. K. Lutz, S. H. Hoverter (attorney).

C. F. Cement Block Corp., Brooklyn, N. Y., $10,000; Vincenza Formichelli, 8798 Sixteenth avenue; Louis Cinque and A. R. Cinque.

Southern Sand Co., Little Rock, Ark., filed articles of dissolution; A. C. Butterworth, president, and Edna Ward Miller, secretary, were the signers.

Providence Sand and Gravel Co., Providence, R. I.; 500 shares of no par value; Charles and Ida Dessosiers, Benjamin W. Grim, all of Providence.

Joplin Marble Quarries Co., Joplin, Mo., $150,000; T. C. Pennington and C. H. Carter, both of Carthage. Eighty acres under option and plan to develop quarries.

Polk County Chert Co., Cedartown, Ga.; C. I. Scarborough, president; E. D. Borders, secretary. Will install machinery for excavating, screening and crushing and moving chert.

Interstate Products Co., Chicago, Ill., $10,000. To manufacture and sell gypsum products and by-products, etc. Incorporators: W. B. Smith, M. Odger. Correspondent: Harold F. Smith, 157 East Erie Street.

Reynoldsville Lime Co., Reynoldsville, Pa., $20,000, manufacture limestone and fire clay. L. B. Johnston, Reynoldsville Pa., W. T. Gross, Falls Creek, S. M. McCreight, Reynoldsville, Pa.
S. C., and T. C. Keith organized to manufacture

Warrior Cement Corp., Demopolis, Ala., $750,000; A. C. Dear, president, 705 Battle Place, Chattanooga, Tenn., reported acquired properties of Gulf State Portland Cement Co., Demopolis, and 500 acres of land.

Alexander Mine and Mineral Corp., Saxtons River, Vt., $50,000; to mine, buy and sell limestone, soapstone, felspar and other products. George P. Alexander and F. L. Osgood of Saxtons River; B. A. Robbins of Cavendish.

Cement

Clinchfield Cement Co., Coreen, Ga., is now operating all departments after electrification of the plant.

Boyne City Portland Cement Co., Boyne City, Mich., plans to construct shortly a new cement mill which will cost about $600,000.

Hanover Cement Co., Lewiston, Mont., is expected within a short time to reopen its plant, which closed last February.

Carles Gehman, Fredericksburg, Texas, plans to erect a cement plant at Ballinger, Texas. The site for the plant has already been leased.

Edison Portland Cement Co., New Village, N. J., has let the contract for construction of a one and two-story packing house and storehouse.

San Antonio Portland Cement Co., San Antonio, Texas, has awarded the contract for the erection of a new office building for their plant at Cementville, Texas.

International Portland Cement Co., Old National Bank Bldg., Spokane, Wash., has suffered a loss from fire and explosion at its plant in Fort Rock, Idaho. J. H. Nell, superintendent, stated that the main plant would be closed for perhaps two months.

Cement Products

H. C. Palmer, Fayetteville, Ark., plans to erect plant for concrete blocks.

W. A. Marks, Nashville, Tenn., intends the establishment of a plant to manufacture Duntile.

Greenville, S. C.—C. R. Johnson, of Anderson, S. C., and T. C. Kieth organized to manufacture concrete sewer and culvert pipe.

Certain-teed Products Co., New York, N. Y., has begun the construction of a plant at Acme, Texas, for the production of "sheetrock."

Sherman Concrete Products Co., 2400 East Third street, Little Rock, Ark., is reported to be building a plant in Hudnall, Texas.

Concrete Brick and Tile Co., of Los Angeles, Calif., R. E. Johnston, president and general manager, is reported about to establish a plant in Richmond, Calif.

Slingluff Co., Inc., has been chartered, with offices in Knickerbocker Bldg., Baltimore, Md., by Horace Slingluff and others, to manufacture a concrete hardener.

Thomasville Concrete Pipe Co. Thomasville, Ga., organized to take over plant of Dawes Construction Supply Co., manufacturers of concrete pipe. W. B. Cochran and W. F. Scott.

Universal Concrete Products Co., Louisville, Ky., H. Eschenbrenner, secretary, plans the erection of a branch factory at Woodland avenue at a cost of $25,000 to specialize in the manufacture of concrete pipe.

Clark Cement and Concrete Construction Co., Hollywood, Calif., hitherto operated by W. A. Clark and H. K. Koebig, will be operated solely by W. A. Clark, with offices at 634 South Western avenue, as the Clark Cement and Concrete Construction Co.

Lime

American Lime and Stone Co., Bellefonte, Pa., has awarded contract for addition to their plant to cost $55,000.

New England Lime Co., Pittsfield, Mass., announce the appointment of David Follett, Jr., as general superintendent and Raymond Elcock as assistant general superintendent of the Adams and Rockdale plants. Mr. Follett has been superintendent of the Adams plant for a number of years.

Quarries

Spencer Quarries, Spencer, S. D., is to add new equipment in order to increase capacity.

Spickard's Quarry, Spickard, Mo., has begun the quarrying and crushing of rock at its plant.

H. Gerard Hartzog, Greenwood, S. C., has acquired 1200 acres near Walhalla, S. C., and will develop a marble quarry.

Northern Illinois Supply Co., Rockford, Ill., suffered considerable loss in equipment and materials through fire recently at their Kilburn avenue quarry.

Andres Stone & Marble Co., Knoxville, Tenn., H. Victor Hart, 2455 E. 5th Ave., Pres., will rebuilt its plant on Blount Ave., which was recently burned with a loss of $75,000.

Jennings County, Ind., commissioners rejected bids on 100 cu. yd. of crushed rock because prices were too high. The bids ranged from $1.55 to $1.75 per cu. yd. at the crusher and $2.25 on the roads.

Hilder Granite Co., St. Cloud, Minn., has passed into receivership. Charles Sennett, of St. Cloud, has been appointed receiver and Donohue and Quigley of the same city are attorneys for the receiver.

National Quarries Co., Carey, Ohio, have filed an appeal in the U. S. Circuit Court of Appeals from the decision by Judge John M. Killits, Toledo, dismissing suit under an injunction to restrain the D. T. & R. R. R. Co. from condemning part of its quarries in Lima, Ohio.

General Crushed Stone Co., Winchester, Mass., was the scene of tests of concussion made by officials of Woburn, Mass., during the blasting of 35,000 tons of rock at the quarries. The tests were carried out for radii of 400 and 1000 ft. from the scene of operation and the results proved that many of the complaints received from residents in the vicinity were unjustified.

Gypsum

Plasterboard Co., Akron, N. Y., plans rebuilding the portion of its plant recently destroyed by fire with a loss of $20,000.

Standard Gypsum Co., Long Beach, Calif., has been ordered to stop construction of docks about its harbor properties by the building department because of denial of permission to build outside its pierhead lines by the harbor commission.

Fluorspar

Aluminum Ore Co., Kentucky Fluorspar Co. and Fairview Fluorspar Co. have been consolidated and will be operated by the Franklin Fluorspar Co., John T. Fuller, president and general manager. The company will maintain its main office at Paducah, Ky.

Sand and Gravel

J. E. Irvine, Rock Springs, Wyo., plans to double the output of his pit by addition of a new unit.

Wilson Sand and Gravel Co., Gallipolis, Ohio, have leased for six months the sand and gravel rights from the city.

Texas Sand and Gravel Co., Waco, Texas, plant at Texand, intend construction of a sand and gravel plant near Lubbock, Texas.

Wissota Sand and Gravel Co., pit at Anson, Wis., has put on a double shift in order to increase its production to about 4,000 tons per day.

Allis-Chalmers Style "N" GYRATORY CRUSHER

Advantages

1—Less friction than directly actuated crushers.

2—Horsepower reduced to a minimum through the use of cut steel gears and forced lubrication.

3—Greater discharge opening and stronger construction.

4—Machine can be made either regular drive, right hand or left hand by simply locating the bearing in the proper opening.

5—The lubrication is of the simplest and the most positive design.

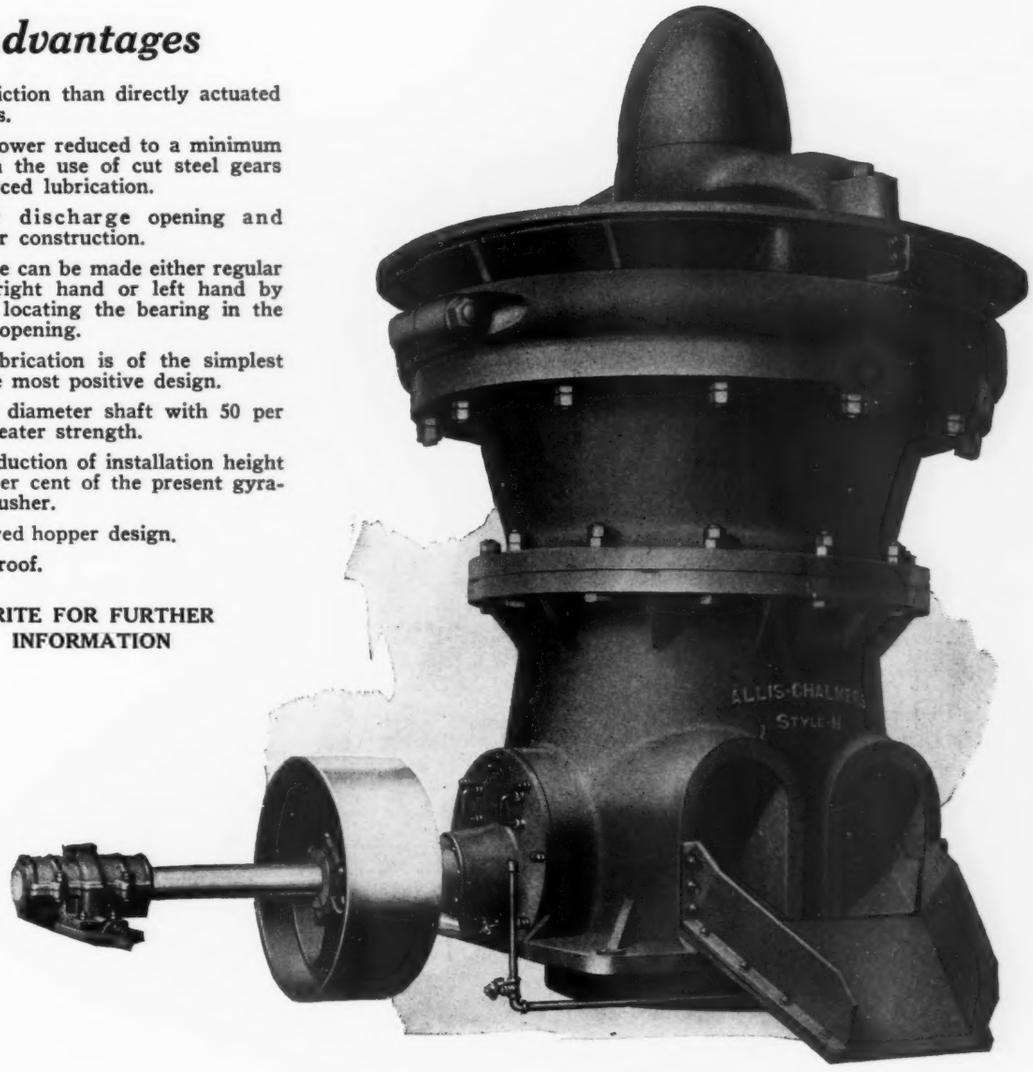
6—Larger diameter shaft with 50 per cent greater strength.

7—The reduction of installation height of 16 per cent of the present gyratory crusher.

8—Improved hopper design.

9—Dust proof.

WRITE FOR FURTHER INFORMATION



ALLIS-CHALMERS PRODUCTS
Electrical Machinery
Steam Turbines
Steam Engines
Gas and Oil Engines
Hydraulic Turbines
Crushing and Cement Machinery
Mining Machinery

ALLIS-CHALMERS MANUFACTURING COMPANY

MILWAUKEE, WISCONSIN. U.S.A.

ALLIS-CHALMERS PRODUCTS
Flour and Saw Mill Machinery
Power Transmission Machinery
Pumping Engines-Centrifugal Pumps
Steam and Electric Hoists
Air Compressors - Air Brakes
Agricultural Machinery
Condensers

Port Angeles Sand and Gravel Co. Port Angeles, Wash., had a loss of about $2,000 to their pier by fire.

Ft. Smith Sand and Gravel Co., Ft. Smith, Ark., is adding new rolling stock and quarrying equipment.

Phoenix Stone Co., Arrington, Va., has begun erection of a new mill, 134x256 ft. and one story height.

Texas Sand and Gravel Co., Waco, Texas, is reported to plan erection of a plant near Weatherford, Texas.

Industrial Gravel and Concrete Co., Portland, Ore., has been organized by Alex Neska, at 980 East Bryant street.

Montgomery Gravel Co. Montgomery, Ala., C. B. Ireland, manager, is about to begin erection of $30,000 worth of new buildings.

Union Rock Co., Los Angeles, Calif., has taken over the entire output of the Los Angeles Sand and Gravel Co., increasing its production to about 6,000,000 tons per year.

Van Sciver Corp., Philadelphia, Pa., has acquired 17 acres of land and is planning erection of new storage and distributing plant for sand and gravel, building supplies, etc., on the site.

Decatur Sand and Gravel Co., Decatur, Ill., has begun construction of a new dredge to replace the old one which was sunk in a mysterious manner recently. The machinery of the old dredge, valued at $38,000, has been recovered and will be used on the new.

W. H. Meredith, Poplar Bluff, Mo., has secured permission from the U. S. War Department to remove gravel from the Current river, which is navigable at this place. Permission has already been secured from the state of Arkansas. It is planned to form a corporation to erect and equip a plant of 1400-yd. capacity per day.

Manufacturers

S. G. Taylor Chain Co. Chicago, Ill., has just completed one-half a century of successful chain manufacturing.

Union Iron Works, Spokane, Wash., has designed a crusher for gray asbestos rock that is said to be able to meet the severe strain made on it by that hard material.

Bray Screen Products Co., New York, N. Y. has completed two films on building stone and marble for use in the public schools in connection with the study of geography.

Gilman Mfg. Co., East Boston, Mass., have opened a branch office and warehouse under management of Hal Crumbliss, at 408 San Francisco Street, El Paso, Texas, at which they are carrying a supply of rock drilling machinery and other equipment to supply domestic territory and Mexico.

Trade Literature

Roeper Crane and Hoist Works, Reading, Penn., have issued a bulletin describing their type "R" electric hoists.

Sanitation Corp., New York, N. Y., has issued **Bulletins** No. G-11 and G-12 describing and illustrating their apparatus for sewage and industrial waste, special pumps and sand filters.

Westinghouse Mfg. and Electric Co., Chicago, Ill., have issued a bulletin illustrating the types and uses of the various electrical measuring instruments they are manufacturing.

Northwest Engineering Co., Chicago, Ill., in their recently issued catalogue, describe and illustrate the various uses and adaptability to which the crawler equipment such as gasoline and electrically operated shovels, cranes and draglines are put.

S. Flory Mfg. Co., Bangor, Pa., has for distribution its new catalogue No. 31, in which is illustrated and described the standard line of steam, electric, gasoline and belt-driven hoists, derricks and special machinery for construction and material handling operations.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., have issued Bulletin No. 1463, in which is described and illustrated their gyratory rock and ore crusher, style "N." It also gives a brief description of operation and list of parts of the crusher with plans for installation in the plant.

De La Vergne Machine Co., New York, N. Y., have issued a catalogue in which a brief history of the company is contained along with illustrations of the various vertical type S I Diesel engines manufactured by them. Mechanical details of design and production are covered in other catalogues issued by them and furnished on request.

Electric Controller & Mfg. Co., Cleveland, Ohio, has issued price lists and bulletins to supersede others previously published. They are numbered 1042-E, 1016-B, 1048, 1024-A, 1040-B and 1033-B and contain information concerning the various types of controller apparatus and motors manufactured along with a complete revised index of all bulletins issued.

Colorado Iron Works Co., Denver, Colo., have issued a bulletin illustrating and describing their plant and facilities for production of machinery.

Westinghouse Electric Mfg. Co., Pittsburgh, Pa., has issued catalogue No. A-01682, in which is listed a complete list of electrical supplies manufactured by them in the past along with new apparatus designed and made in the past two years. It is completely indexed and contains other apparatus that may be obtained at district offices or through agent jobbers.

E. I. du Pont de Nemours Co., Wilmington, Del., has issued an Explosive Service Bulletin in which they describe the advantages and methods of underground quarrying. It is illustrated by cuts which show the best methods of drilling for placing the explosive charge. There is also a chart in which is listed the various explosives manufactured and recommendations regarding the uses to which these should be put.

Personals

Central Stone Co., is planning to remove their offices from Chicago, Ill., to a new building erected for the purpose at the plant in Bloomington, Ind.

Traylor Engineering Co., Allentown, Pa., has been awarded the contract for erection of the new Ft. Collins, Colo., plant of the Colorado Portland Cement Co., Denver, Colo.

Louis Anderson, Jr., chief chemist for the Alpha Portland Cement Co., Easton, Pa., has been elected for a term of two years to the executive committee of the American Society for Testing Materials.

B. E. Lindstrom has been appointed manager of the Chicago office of Barber-Greene Mfg. Co., Aurora, Ill., succeeding George R. Bascom, who died recently. Harold R. Haase has been named as an associate to Mr. Lindstrom.

Robert J. Anderson offers special service in the treatment of aluminum ores, concerning equipment, practice and other problems that occur in the development of aluminum products. Offices are located at Cleveland, Ohio, and Pittsburgh, Pa.

Casparis Stone Co., Columbus, Ohio, has moved its offices from the Clinton Bldg. to 302 Yuster Bldg., Columbus, Ohio. The offices of the Casparis-Ohio Quarries Co. and the Casparis-Pennsylvania Quarries Co. will also be moved to this address.

David Follett, Jr., for many years superintendent of the Adams plant of the New England Lime Co., has been made general superintendent of the Adams and Rockdale plants of the company. Raymond Elcock has been named as assistant general superintendent of these plants.

National Sand and Gravel Convention at Atlanta January 13-14

T. R. BARROWS, executive secretary of the National Sand and Gravel Association, has announced the date and place of the 1925 convention—the Atlanta-Biltmore Hotel, Atlanta, Ga., January 13 and 14. The board of directors will meet January 12.

The Atlanta-Biltmore is a new hotel, managed by the same company as the Biltmore hotels in New York, Los Angeles and other cities. Secretary Barrows promises golf and other summer sports. Anyhow, it is within easy reach of the Florida beaches.

Power Show to Be Held in New York

THE fourth National Exposition of Power and Mechanical Engineering will be held in the Grand Central Palace, New York, from November 30 through December 5, 1925. Over 400 exhibitors will display the newest types of power machinery, combustion equipment, valves and fittings and measuring and recording instruments. It is expected that the show will be attended by 100,000 people. As usual, the annual meetings of the American Society of Mechanical Engineers and the American Society of Refrigerating Engineers will be held during the week of the show. The managers are Fred W. Payne and Charles F. Roth, with offices in the Grand Central Palace.

New $100,000 Sand and Gravel Plant for Williamsburg, Pennsylvania

ORGANIZATION of a company to erect a sand and gravel plant was announced recently. Ten acres of land have already been purchased and work is soon to start in dredging the river to permit the loading barges at the plant to be erected. The Reading R. R. Co. has made provision for the placing of a siding in connection with the company's yards. The personnel of the new company has not yet been made public.—*Williamsport (Penn.) Sun.*

Growth of Concrete Roads in the United States

THE British Portland Cement Association announces that an inquiry was addressed recently to the Portland Cement Association, Chicago, for the latest statistics available in connection with concrete roads. The reply, which has just come to hand, is as follows: From Jan. 1 to June 6, 1925, contracts have been placed for the laying down of 51,080,153 sq. yd. of concrete paving for roads, streets and alleys. During the corresponding period of the three previous years the figures were: Jan. 1-June 10, 1922, 40,559,281 sq. yd.; Jan. 1-June 9, 1923, 33,241,443 sq. yd.; Jan. 1-June 7, 1924, 41,769,755 sq. yd. The figures for this year break all previous records. At December 31 last, the total length of concrete roads in U. S. A. already exceeded 32,000 miles as compared with Britain's total of about 250 miles.—*Contract Journal* (London, England).

Sand-Lime Brick Plant in Columbus

THE Peerless Brick Co. is the name of a new corporation, formed in Columbus, Ohio, for the purpose of manufacturing sand-lime brick. The company is a subsidiary of the Columbus Builders' Supply Co., which has the agency for the output. Production of brick has been started and the product is already on the market. William F. Kern, president of the Columbus Builders' Supply Co., is president; Hayes K. Hill, vice-president; G. E. Marzluf, secretary, and John H. Edwards, treasurer. The first unit of the plant has a capacity of 25,000 daily and it is planned to increase this later on.